LISA GOLLIN EVANS (MA SB # 200730)
(Admitted *Pro Hac Vice*)
Earthjustice
21 Ocean Avenue
Marblehead, MA 01945
(781) 631-4119
levans@earthjustice.org

JAN HASSELMAN (WSB #29107)
(Admitted *Pro Hac Vice*)
Earthjustice
705 Second Avenue, Suite 203
Seattle, WA 98104
(206) 343-7340
(206) 343-1526 *[FAX]*
jhasselman@earthjustice.org

Attorneys for Plaintiffs Sierra Club, Great Basin Resource Watch, Amigos Bravos, and Idaho Conservation League

GREGORY C. LOARIE (CSB #215859)
Earthjustice
426 - 17th Street, 5th Floor
Oakland, CA 94612
(510) 550-6725
(510) 550-6749 *[FAX]*
gloarie@earthjustice.org

Local Counsel for Plaintiffs

THE HONORABLE WILLIAM H. ALSUP

UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

SIERRA CLUB, et al., Plaintiffs, v. STEPHEN JOHNSON, et al., Defendants, and SUPERFUND SETTLEMENTS PROJECT, et al., Defendant-Intervenors.	Case No. 3:08-cv-01409-WHA DECLARATION OF DAN RANDOLPH

I, DAN RANDOLPH, state and declare as follows:

1. I am over the age of 21 and competent to testify to all matters contained herein. I reside at 1 Booth Street, Apt. A, Reno, Nevada. I have lived in Reno since September of 2006.

2. I am the Executive Director and a member of Great Basin Resource Watch ("GBRW"). GBRW's mission is to protect the health and well being of the land, air, water, wildlife, and human communities of the Great Basin from the adverse effects of resource extraction and use. GBRW was founded in 1994 as Great Basin Mine Watch ("GBMW") to protect the environment and people of the Great Basin from the negative aspects of mining. The name of our organization was changed in 2008 to Great Basin Resource Watch to reflect our broader mission. GBRW today represents over 300 members who are concerned about environmental degradation from current and past mining operations.

3. The Great Basin, primarily within the borders of the state of Nevada, is ground zero for hardrock mining in the United States. Were Nevada a country, it would rank fourth among the world's top gold producing nations. There are 24 major metal mines in Nevada, and metal mining is one of the primary industries in much of the state. Based on the industry's own ratings, Nevada is the second most sought-after mining territory around the globe. Based on the U.S. EPA's ratings, mining is the biggest polluting industry in the nation. The metal mines of Nevada released over 200 million pounds of hazardous chemicals in 2006, according to the Environmental Protection Agency.

4. The Great Basin is one of the most biodiverse regions on the continent with the most roadless pristine land remaining in the United States. But the region faces a disastrous level of land and water pollution due to mining activities.

5. I have hiked and biked in the Reese River and Humboldt River valleys since 1998. I have swum in the Humboldt River both above and below the Reese River. I enjoy the lands of Nevada for their wild feel, their emptiness, and their plant and animal life. The enjoyment of these lands is currently one of the primary activities my wife and I participate in. I plan on continuing to enjoy the lands and waters of the Great Basin for the rest of my life.

Earthjustice
705 Second Ave., Suite 203
Seattle, WA 98104
(206) 343-7340

6. As an avid botanist, I enjoy watching the plant communities throughout the year, and how they change with small changes in topography, elevation, and aspect. I enjoy sampling the edible plants of the Great Basin, such as wild onion, Yampa or Yomba root, various currant and gooseberries, thimbleberry, raspberry, and other edible plants.

7. Many GBRW members hike, hunt, fish, gather edible plants, and medicinal plants on the private and public lands of Nevada, including the mining intensive area of north central and north eastern Nevada. Their enjoyment of these activities is directly impacted by activities that pollute either the land or the waters of the area, since their enjoyment is largely based upon the health, wildness, and pristine nature of the landscape and water.

8. The Phoenix Mine is a large copper and gold mine south southeast of Battle Mountain, Nevada. The mine is in the Reese River drainage, which is a tributary to the Humboldt River, the largest river in central Nevada. The Phoenix Mine is wholly owned and operated by Newmont Mining Corporation ("Newmont").

9. I have been concerned with the impacts of the Phoenix Mine on the lands and waters of the Great Basin since the late 1990s when the current mining plan was first proposed by Battle Mountain Gold, subsequently bought by Newmont. In the capacity of the Southwest Circuit Rider for Mineral Policy Center / Earthworks, I commented on the Draft Environmental Impact Statement, as well as the Final Environmental Impact Statement ("FEIS"). Most of my comments were in regard to the high likelihood for the mine to require treatment in perpetuity, the high likelihood for the mine to cause land and water contamination, and the need for a fully adequate bond to ensure these pollutants would not harm the land and water of the region. (Exhibit A).

10. The U.S. Environmental Protection Agency ("EPA") submitted comments on the Phoenix FEIS that stated: "The project area includes mining facilities from more than a century of copper and precious metals mining. Groundwater and surface water in the area currently exceed drinking water standards for numerous contaminants, including pH, total dissolved solids, and metals. The acid-generating potential of the waste rock at the Phoenix Mine is high

Earthjustice
705 Second Ave., Suite 203
Seattle, WA 98104
(206) 343-7340

compared to other active or proposed hard rock mines in the western United States. According to the Final EIS, the majority of waste rock at the site is acid-generating; and acidic water moving through the waste rock and tailings from the proposed project will mobilize metals and sulfates, leaching them into groundwater beneath the site after mine closure." (Exhibit B at page 1).

11. The EPA further noted that: "EPA believes the project will likely create a perpetual and significant acid mine drainage problem requiring mitigation for hundreds of years. Our conclusion is based on the information provided in the BLM's NEPA documents for the Phoenix Mine project, including information about current mitigation activities for prior and ongoing mining activities at this site, as well as our experience with sites in northern Nevada and elsewhere in the region." (Exhibit B at page 2).

12. The EPA noted further that: "The Final EIS states that the proposed mine closure and reclamation activities would not provide sufficient neutralizing material to prevent perpetual acid mine drainage from the site. The Proposed Action is predicted to result in further degradation of groundwater, including exceedences of MCLs for numerous parameters, including low pH, sulfate, and at least 19 other constituents." (Exhibit B at Attachment 1, page 1).

13. The EPA argued that the bond for the Phoenix Mine should be at least $33,530,301, rather than the $408,000 proposed by the Bureau of Land Management ("BLM"). (Exhibit B at Attachment 1, page 15).

14. GBMW, along with the Western Shoshone Defense Project, appealed the BLM's Record of Decision for the Phoenix Mine to the State Director in 2004. Our appeal was largely based upon the inadequacies of the BLM's requirements for financial assurance and bonding to handle the post-mining reclamation, closure, and long-term water treatment costs related to release of hazardous substances. (Exhibit C).

15. In an expert review of the reclamation, closure, and post-mining water treatment plans and financial cost needs of the FEIS, Jim Kuipers Principal/Consulting Engineer for

Earthjustice
705 Second Ave., Suite 203
Seattle, WA 98104
(206) 343-7340

Kuipers & Associates, LLC, argued that the bond for the Phoenix Mine should be approximately $60 million. (Exhibit D).

16. If the bond for the Phoenix Mine is indeed insufficient, which we maintain is the case, the interests of GBRW's members will be directly affected by either the pollution from the site contaminating the water and land of the region, or by the increase in public financial burden to handle these costs in perpetuity.

17. As the Executive Director, I am one of GBRW's lead staff for our organization's work on hardrock mining. I and our Staff Scientist are in charge of reviewing and commenting on proposed mineral exploration and mining projects for GBRW. GBRW's work has included commenting on dozens of proposed hardrock mines, and the various permits needed by them, litigation over inadequate bonding at mine sites, and grassroots organizing to reform the Mining Law of 1872, which governs hardrock mining. I have toured the Phoenix Mine, and more than a dozen other hardrock mines throughout the Great Basin and North America.

18. I am concerned that the mining companies will not have sufficient resources to clean up in a complete and timely way the waste rock dumps, tailings piles, heap leach pads, pit lakes, and exposed mine walls at the various hardrock mines in the Great Basin. The Great Basin is already plagued by numerous "orphan" and abandoned mines that continue to release pollutants to the environment, but that are no longer operating and for which no viable corporate entity is responsible for clean-up.

19. With the expiration of the Superfund tax, there are insufficient federal funds for clean-up of such orphan sites in a timely manner. Thus I am concerned that the many hardrock mines that are or may be Superfund sites may not be cleaned up if the responsible parties cannot fund the remediation.

20. Failure to clean up the hardrock mines in the Great Basin in a timely manner will result in degraded water quality from a large variety of contaminants, harm to fish and wildlife, and other environmental harms. This degradation will directly harm my interests and the interests of GBRW's members in maintaining clean water, important habitat for Lahontan

Earthjustice
705 Second Ave., Suite 203
Seattle, WA 98104
(206) 343-7340

cutthroat trout, and the scenery and amenities important to the economy of the Great Basin.

21. If the U.S. Environmental Protection Agency required companies that generate hazardous substances, like mines, to provide financial assurance to clean up the pollution caused by their activities, the groundwater and streams in the Great Basin may never have been polluted because the owners and operators of the mines would have had greater incentive to manage their wastes in a responsible and safe manner.

22. Without such financial assurances, I am not sure if the pollution generated by the mines will ever be cleaned up by the owners or operators of the mines.

23. If the U.S. Environmental Protection Agency promulgates regulations that require the operating hardrock mines in the Great Basin, such as the Phoenix Mine, to maintain financial assurance, adequate funds for clean up of the mines will be available in the future, and the mine owners will have greater incentive to run the mine to prevent pollution.

24. If the U.S. Environmental Protection Agency promulgates regulations that require companies that generate and handle hazardous substances to maintain financial assurances for clean-up, pollution of other rivers may be prevented and more timely and complete clean-ups may occur.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge. Executed this 2nd day of September, 2008, at Durango, Colorado.

DAN RANDOLPH

Earthjustice
705 Second Ave., Suite 203
Seattle, WA 98104
(206) 343-7340

EXHIBIT A

Pam Jarnecke
Bureau of Land Management
50 Bastian Road
Battle Mountain, Nevada 89820

February 11, 2002

RE: Phoenix Project Final Environmental Impact Statement:

Dear Ms. Jarnecke:

These are the comments of Mineral Policy Center (MPC) on the Final Environmental Impact Statement (FEIS) for the proposed Phoenix Project. Mineral Policy Center is a national non-profit organization that works with individuals and organizations throughout the country to reduce the negative social, economic, and environmental impacts associated with hard-rock mining. We submitted both scoping and Draft EIS (DEIS) comments on the Phoenix Project, attended a public meeting, and appreciated the opportunity to provide these comments on the FEIS.

We incorporate into this letter our comments on the Draft EIS, in full, as well as the full comments of Great Basin Mine Watch (GBMW)(including the comments prepared by Jim Kuipers, Center for Science in Public Participation, for Great Basin Mine Watch), Sierra Club, and Western Shoshone Defense Project on both the Draft EIS and the Final EIS. While we gratefully acknowledge the contributions from these other organizations, these comments are solely the responsibility of Mineral Policy Center.

Newmont/BMG (Proponent) proposes to take a site that is currently a serious acid generating and perpetual treatment site and move nearly a billion tons of rock, the vast majority of which will be extremely acid generating. In addition, rather than two small pits which intercept groundwater and may form problematic pit lakes, the Proponent proposes to create three massive pits which will intercept ground water at much deeper levels. The basic reassurance for the future of the site and the waters and lands affected by this, for a period admitted to be in the thousands of years, is a ground water pump-back and treatment plan, the details of which will be developed later. The FEIS admits that water contamination from the proposed action will continue for over 10,000 years (although admittedly at unknown levels). If the BLM and the Proponent admit that water pollution will last this long, does this not constitute undue and unnecessary degradation? If such long lasting pollution does not, would the BLM admit that any mine disturbance would constitute undue and unnecessary degradation?

It is also clear that the site is at present in violation of numerous laws and regulations and the BLM by statutory mandate must immediately cause Newmont to rectify the situation. The BLM and Newmont must fully and adequately manage the site so as to immediately stop all ongoing violations as well as prevent all future ones.

As noted herein and in the FEIS, the current operations at the site violate a number of state surface and ground water standards. These violations not only constitute “unnecessary or undue degradation” under the 3809 regulations, they are also a violation of the current Plan of Operations which was originally approved with the condition that the operations would always comply with these standards. The Proponent has shown itself incapable of managing the site in a manner that will not degrade the waters, both surface and groundwaters, of the State of

Nevada. Therefore, the BLM must not assume based upon modeling and proposed remediation plans, that the Proponent will be capable of managing the site after moving an additional 900 million tons of rock. We can all promise to do better next time, but the BLM must rely upon current management results rather than promises, in order to protect the public resources involved or impacted by the proposed project.

MPC therefore concludes that the current proposal will neither protect either surface or ground water from pollution that will violate the Clean Water Act and Nevada Pollution Control Act. It will also illegally cause nearby streams and springs to go dry. Drying streams and tributary springs also violates the Clean Water Act. There is also substantial evidence that the bond is insufficient and that Newmont does not have the financial resources to complete this project while protecting the other resources. For these reasons, the project as proposed will cause undue or unnecessary degradation and may not be permitted. MPC further concludes that the No Action alternative is also illegal because it will result in groundwater degradation. Therefore, the Final EIS should have included an alternative that both treats the contamination problems and reclaims the existing disturbance.

Soils and Reclamation:

The FEIS repeatedly states that the material proposed for use to cap waste rock piles, backfilled pits, and heap leach pad, and tailings piles will likely pose an ecological risk to wildlife, birds, microorganisms, plants, and livestock. (FEIS pgs. 3.3-15 through 3.3-18, including Tables 3.3-7,8&9) The ecological risk is posed by at least nine constituents: arsenic, cadmium, copper, fluoride, nickel, selenium, lead, mercury, and zinc. The capping material will exceed the BLM Wildlife and Livestock Risk Management Criteria for arsenic, cadmium, copper, lead, and zinc. The material when tested under the Meteoric Water Mobility test exceeds Nevada State Irrigation and Livestock Surface Water Standards for arsenic, cadmium, copper, fluoride, nickel, and selenium. While it is recognized that there have not been adequate tests done to fully measure the true ecological risk posed by this material being used as a growth medium, the test that were done clearly show that **further tests must be conducted to determine the ecological risk posed by use of this material for capping before the project can be approved.** The BLM in the FEIS relies upon a Monitoring and Mitigation plan (S-4, FEIS pgs. 3.3-20 and 21), to handle this clear indication of a problem. **In light of the ecological risk predicted by current studies, the BLM must conduct further studies before the project is approved.** Since the BLM outlines a plan for such studies (S-4), there is no reasonable excuse for not requiring these studies before the problem occurs. Since the BLM predicts an impact, it has the responsibility to obtain all the information necessary to assess it. See Island Mountain Protectors, 144 IBLA 168, a decision that stayed a project for lack of information necessary to assess the flow of groundwater. See also Great Basin Mine Watch, et al, 148 IBLA 248.

> Finally, insofar as BLM has determined that it lacks adequate information on any relevant aspect of a plan of operations, BLM not only has the authority to require the filing of supplemental information, it has the **obligation** to do so. (Great Basin Mine Watch, et al, 148 IBLA 248, 256, underline in original, bold emphases added)

Insufficiency of adequate planning for expected ecological risks:

The proposed project relies upon the ability of the Proponent to contain the acid generating rock within caps composed of non-acid generating materials. If as indicated by current understanding, these non-acid generating materials pose an ecological risk to plants, microorganisms, and animals, the reliance upon the use of this material is seriously flawed. **In the mitigation plan (S-4 (4)) it is planned to handle any ecological risk by unspecified measures that may include excluding cap materials with elevated metal concentrations, or recapping with other materials. What such a plan requires is a source for such non-elevated metal materials, which is not discussed in the FEIS at all. Again, since current understanding strongly implies that there will be a problem, and since capping material is**

already in short supply for the amounts needed, this issue must be rectified prior to project approval.

Cultural and Ethnobotanical Issues:

The FEIS details the concern shown by Native Americans, Western Shoshone in particular, concerning the project. These concerns must be adequately handled.

The FEIS states that direct impacts to an unspecified number of the 57 identified plant species having ethnobotanical relevance would occur (FEIS, 3.4-12). The BLM then minimizes this impact since nine species with ethnobotanical relevance are included in the species mix planned for under the Reclamation Plan. This is absurd, as all the plants included in the Reclamation Plan's reseeding mix are common to the area, and it is probable that many of the 48 other species are much more narrowly available in the area. In addition, since the capping mix may preclude some species due to toxicity (see comments above), or accumulate toxins, the impact may be greater. Also, since the capping material may provide a conduit for metals from soil to plant to animals (including humans) the ethnobotanical use of the area may be severely impacted by the proposed project.

Air Quality:

The proposed metals recovery process would involve the use of a carbon-in-leach cyanide circuit. During this process, the activated carbon used for precious metal recovery would be subjected to high temperatures during both stripping and thermal reactivation (FEIS, pg. 2-29). During this process, any mercury that has been adsorbed onto the carbon could be volatilized. Unless this volatilized mercury is captured, it can be emitted to the environment. According to the EPA, 9,400 lbs of mercury were released to the air by Nevada mines in 1999. (1999 Toxic Release Inventory, Public Data Release, US EPA, Report Number EPA 260-R-01-001, April 2001) Despite this, and the raising of this concern by MPC and the Environmental Protection Agency in DEIS comments (FEIS, Draft comments and Responses, question 1-33), the FEIS contains no analysis of mercury emissions. In the Response (question 1-33) the BLM notes that mercury concentrations are less than 1 part per million in the site rocks. At 1ppm, and assuming a rate of 25,000 tons ore processed per day (based on the FEIS mill ore crushing estimate, pg. 2-26), 50 lbs of mercury could be released per day. This would translate to over 1,500 lbs per year, so even a fraction of this release is significant. The BLM must analyze the potential release of mercury to the air. There is no evidence of any analysis of this issue having been done.

The potential exposure of workers or the environment to all HAP pollutants including mercury, hydrogen-cyanide, or others must be fully addressed.

Loss of Springs and Perennial Stream Reaches:

The FEIS states that the perennial reaches of Willow Creek are net gaining due to groundwater inflow (FEIS, 3.2-8). The FEIS also states that the draw down of groundwater due to the proposed project would dry up some of the perennial reaches of the creek (FEIS, 3.2-47). As we discussed in our DEIS comments, it is illegal for the BLM to allow this stream to dry up.

The FEIS predicts that there are ten inventoried perennial springs that will or may be affected (it is assumed in the FEIS that they will be affected) by the proposed project. It is predicted that "any flow reduction or elimination that occurs is likely to persist for the foreseeable future." (FEIS, 3.2-47) In our DEIS comments we noted that any drying up of perennial springs is illegal under Public Water Reserve No. 107 (comment 14-8). We repeat that assertion.

Since significant impacts are predicted to occur to both perennial streams and springs, the reliance upon a future mitigation plan is unacceptable. The FEIS states that a detailed, site-specific plan **would be** prepared. (FEIS, 3.2-85) This plan must be prepared and reviewed by the public before project approval. The FEIS is incomplete in this manner.

Surface Water:

In our DEIS comments we commented at length on the proposed illegal discharge from retention ponds (Comment 14-16). The issues raised are still relevant.

Pits:

The FEIS suggests that submergence and added lime will prevent AMD in the pits. (FEIS, 2-24) There is no calculation as to how much lime would be needed to achieve this goal, nor where the lime would be gotten. Due to the mass of acid-generating rock involved, there may not be enough lime available from existing sources in the region. The amount and source of lime must be discussed prior to project approval. In addition, this issue must be explicitly dealt with in the bond calculations.

The FEIS only looks at one alternative for dealing with pit lakes, the backfilling option. In our DEIS comments, as well as the EPA, GBMW and other DEIS comments, many other options were discussed. The DEIS included other options. The FEIS does not contain any sufficient rationale for not exploring in detail other options. This is a clear NEPA violation.

We refer to the comments of GBMW for more discussion of pit lakes.

Acid Mine Drainage:

The Phoenix Project will measure the extent to which the mining industry (as represented by Newmont, the likely largest gold mining company in the world) and the BLM have learned any lessons from the many acid generating mine sites around the world. What is proposed is to greatly expand an already acid-bleeding site, to do insufficient reclamation (see comments of GBMW), and to rely on a weak monitoring and mitigation plan (see comments of GBMW). The plan rests on the perpetual need to successfully collect all polluted groundwater through groundwater pumping, followed by perpetual treatment with lime. For the BLM to knowingly approve a project which will cause massive groundwater pollution for thousands of years, based on a perpetual pump and treat plan, is completely irresponsible.

The FEIS does not contain any calculation as to what will be required to treat the AMD for the next few thousand years, nor the mass of metal laden sludge that would be produced, nor where and how this sludge would be handled. This is a clear need due to the predicted effects. The FEIS is incomplete and inadequate without such full discussion. As with the pit backfill, the mass of lime needed is huge, and there may not be enough lime available from existing sources in the region. The amount and source of lime must be discussed prior to project approval. In addition, this issue must be explicitly dealt with in the bond calculations.

The FEIS does not discuss the sludge disposal facility, where it would be located, how it may affect surface or groundwater, how it would be managed, how it would be reclaimed, or any other details. Since there is no discussion, no alternatives are presented as well. All of this omission is a violation of NEPA.

Reclamation:

The reclamation of the site as outlined in the FEIS is inadequate. Due to the very high AMD predictions for the waste rock, tailings, heap leach pads, pits, etc., the use of either water balance covers or water barrier covers is a must. We refer to the comments of GBMW and Mr. Jim Kuipers. **The site must be managed to prevent water from contacting all waste rock, tailings, heap materials, and pits.**

The FEIS relies on future revegetation studies. Given that the Proponent has been on site for many years, such reliance is unfounded. The BLM must show that the reclamation plans will work prior to permitting the project.

Tailings:

The tailings facilities would be built in part on top of existing tailings. (FEIS, 2-30) These existing tailings are already causing groundwater degradation. (FEIS, 3.2-78) Until the current groundwater pollution is stopped and fully remediated, the BLM must not allow the vast expansion of

these facilities. MPC has repeatedly seen how the use of existing facilities is blamed for problems which arise.

The FEIS does not contain sufficient geochemical characterization information on the tailings materials (we also reference the comments of Mr. Jim Kuipers, and GBMW). The FEIS does admit that the tailings materials will likely cause AMD and even those samples that did not showed high levels of metals. (FEIS, 3.2-57 & 58) The FEIS relies on the successful containment of the tailings to prevent pollution to surface and ground water. (FEIS, 3.2-57) However, it is not shown that the tailings facility will be contained forever. The lining will degrade with time, and precipitation will infiltrate into the tailings. The FEIS is insufficient in its complete lack of discussion of impact to surface and ground water from the tailings.

Heap Closure:

As noted in the comments of Mr. Jim Kuipers, heap closure is not as simple as suggested in the FEIS. Since the materials will likely produce AMD in time, a plan for complete capture and treatment of this water must be included.

Financial Assurance:

The financial assurance discussed in the FEIS is insufficient. (FEIS, 2-48) We refer to the comments of Mr. Jim Kuipers and GBMW for a detailed discussion of financial assurance.

Reliance Upon Future Monitoring and Mitigation:

The FEIS dodges every predicted significant impact by relying upon weak monitoring plans and undeveloped or conceptual at best mitigation plans (examples include stream and spring flows, groundwater quality, capping materials analysis and management, revegetation, and wildlife). Specific weaknesses in the monitoring and mitigation plans are given in comments of GBMW and Mr. Jim Kuipers. The BLM must include specific and detailed plans for preventing all significant impacts. The reliance upon undeveloped or general and conceptual plans to handle impacts that are predicted to last thousands of years is totally unacceptable.

The reliance on all plans working, and all designed features performing as planned is flawed. The FEIS even states that "exploration borehole plugs may not have functioned as designed" (FEIS, 3.2-76). Clearly, the Proponent is unable to achieve all the predicted results, and not all designed features perform as planned. Given this, the BLM must show how, in detail, the project will meet all state and federal laws.

Groundwater:

While we incorporate, and largely rely upon, the comments of GBMW, concerning groundwater issues, there are some weaknesses which are readily apparent from even a casual reading of the FEIS.

The area contains many faults and the geology is highly fractured. The modeling done on contaminate movement does not take into account the preferential flow through such a system.

The groundwater mitigation plan relies solely upon wells, given the fractured nature of the site, the location of such wells in order to capture all the groundwater polluted by the Proponent, is clearly poorly known at best. In addition, the BLM did not include any methods such as slurry walls or grout curtains that could help direct polluted water to the extraction wells.

The FEIS is incomplete due to the lack of alternatives studied for groundwater pollution capture.

The laws of the State of Nevada prevent the BLM from allowing a project that will degrade the groundwater, period. The proposed project will degrade the groundwater, even if the mitigation plans work. Therefore, the BLM cannot permit the proposed project.

Alternatives Considered:

The FEIS fails to meet the NEPA mandated requirement that the BLM consider a range of alternatives. Both alternatives in the FEIS allow for and predict that groundwater degradation will occur.

(FEIS, Tables A-4 and A-5) The BLM failed to analyze any alternatives that would remedy the pollution predicted under the No Action Alternative, and prevent further pollution.

The BLM has the authority and the responsibility to require financial assurance under the No Action Alternative:

The FEIS states "there is no bonding requirement currently in place to fund long-term monitoring and mitigation for the No Action Alternative." (FEIS, 3.2-77) The BLM, under FLPMA, Section 3809.522(c) has both the responsibility and authority to require adequate financial assurance. Since the existing project is recognized by this statement in the FEIS as being under-bonded, the BLM must take immediate action to remedy this deficiency. Instead, the statement appears intended to argue for the Preferred Alternative, since the No Action Alternative appears to allow the Proponent to walk away from a polluted site.

Thank you for the opportunity to comment. Again, we reference and fully incorporate the comments of Great Basin Mine Watch, Mr. Jim Kuipers, Sierra Club, and Western Shoshone Defense Project. If you have any questions please feel free to call.

Respectfully,

Dan Randolph
Southwest Circuit Rider

EXHIBIT B

November 25, 2002

Mr. Robert Abbey
State Director
Bureau of Land Management
P.O. Box 12000
1340 Financial Boulevard
Reno, NV 89520-0006

Dear Mr. Abbey:

The U.S. Environmental Protection Agency (EPA) has reviewed the **Phoenix Mine Project Final Environmental Impact Statement (EIS), Lander County, NV [CEQ #020001]**. Our review and comments are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's (CEQ) NEPA Implementation Regulations at 40 CFR 1500-1508, and Section 309 of the Clean Air Act. We appreciate the final deadlline extension we received verbally from Jean Rivers-Council, and are providing our comments within the agreed upon timeframe.

The Bureau of Land Management (BLM) proposes to issue a mining plan of operation to Battle Mountain Gold Company (BMG) for its Phoenix Mine near Battle Mountain, Nevada. BMG is a wholly owned subsidiary of Newmont Mining Corporation. The proposal would significantly expand BMG's current mining and mineral processing operations at the site, over a 28-year period, including development of two new open pits, expansion of two existing pits, processing of previously mined stockpiled gold ore, expansion and construction of heap leach, milling, waste rock, and tailings facilities, and backfilling of three existing open pits. The proposed project would disturb 6,497 acres (greater than 10 square miles) of public and private lands. Of this, approximately 4,295 acres would be new disturbance (2,382 acres of public lands and 1,913 acres of private lands).

The project area includes mining facilities from more than a century of copper and precious metals mining. Groundwater and surface water in the area currently exceed drinking water standards for numerous contaminants, including pH, total dissolved solids, and metals. The acid-generating potential of the waste rock at the Phoenix Mine is high compared to other active or proposed hard rock mines in the western United States. According to the Final EIS, the majority of waste rock at the site is acid-generating; and acidic water moving through the waste rock and tailings from the proposed project will mobilize metals and sulfates, leaching them into groundwater beneath the site after mine closure.

In order to prevent post-closure off-site migration of the contaminant plumes, BLM's proposed mitigation includes implementation of the *Contingent Long-Term Groundwater Management Plan* (Brown and Caldwell, 2001), and establishment of a Long-Term Trust Fund by BMG to ensure that funds are available to implement the *Contingent Long-Term Ground Water Management Plan* in perpetuity. The funding level of the trust fund is based on the *Preliminary Cost Estimate for the Phoenix Project Contingent Long-Term Groundwater Management Plan ("Cost Estimate"),* prepared by BMG's contractor, Brown and Caldwell.

This project will be the first one in the country to include post-closure financial assurance because of the anticipated acid mine drainage, under the recently finalized Surface Mining Regulations for Surface Mineral Operations at 43 CFR 3809 ("3809 Regulations"). Therefore, BLM's approach for applying the new 3809 Regulations is critical to ensuring the mining operator bears the costs of reclaiming mined lands and fully mitigating the project's impacts after mining operations have ceased. We believe BLM's approach in this regard remains flawed. We do not agree that the Long-Term Trust Fund and an additional $1 million surety, as currently proposed by BLM, would adequately cover the cost of implementing the *Contingent Long-Term Groundwater Management Plan*. EPA estimates that the mining company should set aside $33.5 million into the trust fund at project startup rather than the $408,000 proposed by BLM. The environmental acceptability of this project hinges on an adequately funded long-term mitigation program. While we agree with BLM's approach to monitoring the trust fund on a triennial basis, BLM's current strategy does not allow for a timely and informed judgment about the project's cost-effectiveness or whether an alternative approach such as improved reclamation should be reconsidered. We have attached detailed comments in support of these conclusions [Attachment 1].

EPA believes the project will likely create a perpetual and significant acid mine drainage problem requiring mitigation for hundreds of years. Our conclusion is based on the information provided in the BLM's NEPA documents for the Phoenix Mine project, including information about current mitigation activities for prior and ongoing mining activities at this site, as well as our experience with sites in northern Nevada and elsewhere in the region. While the modeling done by BLM to predict groundwater impacts may assume a considerable amount of uncertainty, we do not believe its conclusions represent a "worst case" scenario, as represented by BLM in recent correspondence and discussions. We recommend BLM take a prudent approach to a project of this magnitude and projected impact, consistent with the objectives of NEPA, BLM's 3809 Regulations, and discussions in a recent advanced notice of proposed rulemaking regarding acid mine drainage issued by the Department of Interior's Office of Surface Mining.

The Final EIS is inadequate as it does not yet include an itemized cost estimate for closing and perpetually operating and maintaining the site, or meaningful assurances that a financial instrument will exist to ensure funds are available in perpetuity to prevent degradation of water quality and impacts to biological resources. From our 20 years of experience with the remediation of mine sites throughout our region, we have acquired extensive technical and financial expertise and knowledge that we believe should be applied to the *Contingent Long-*

Term Groundwater Management Plan for this project. We recommend additional analyses to determine the appropriate levels of funding for the Long-Term Trust Fund before project startup. Given the significance of this project, we believe BLM's additional analyses and conclusions should be circulated in a Supplemental Draft EIS for public comment, in accordance with NEPA and CEQ's NEPA Implementation Regulations. In addition, EPA strongly recommends the Record of Decision (ROD) include the following commitments and information:

- BLM will engage an independent third party outside of the Department of Interior and EPA to complete a full analysis of the costs and financial predictions associated with BMG's ability to implement the *Contingent Long-Term Ground Water Management Plan* before the project's first triennial review. EPA can assist you in selecting the appropriate third party.

- BLM will apply the results of the third party evaluation and adjust the funding levels to support the *Contingent Long-Term Ground Water Management Plan* in the first triennial review of the Long-Term Trust Fund.

- BLM will specify the detailed mechanics of the Long-Term Trust Fund that are critical to ensure that sufficient funds would be available to implement the *Contingent Long-Term Groundwater Management Plan* in perpetuity.

- BLM will identify specific clear triggers and standards that will require the owner/operator to increase the Long-Term Trust Fund, or allow BLM to transfer money from any unused portion of the reclamation bond into the trust fund.

- BLM will require Newmont to act as guarantor of these financial assurance amounts to ensure that taxpayer dollars will not be required in the event that BMG is unable to meet its financial assurance obligations.

- BLM will include the new reclamation measures that have been added to the Phoenix Mine proposal since publication of the Final EIS.

We realize that your current approach for the post-closure phase of this project was formulated prior to development of BLM's national guidelines for implementing the new 3809 Regulations. Clearly, our dialogue on the Phoenix mine project would have benefitted from a final guidance document. EPA welcomes the opportunity to work with BLM on these guidelines. We strongly encourage BLM to take advantage of our experience and expertise in developing long-term trusts for future treatment costs as you determine how to implement this new rule.

EPA appreciates the opportunity to review this Final EIS and we look forward to working with you as this project continues. Our goal is to work with you to prevent serious long-term contamination of ground and surface waters. If you have any questions, please call me at (415) 947-8702, or refer staff to Lisa Hanf, Federal Activities Office Manager at (415) 972-3854 or Jeanne Geselbracht, our lead NEPA reviewer for this project, at (415) 972-3853.

Sincerely,

Wayne Nastri
Regional Administrator

002424

Attachments:

Attachment 1: EPA's Detailed Comments on the Phoenix Mine Final EIS
Attachment 2: May 8, 2002, Letter from Enrique Manzanilla, EPA, to Robert Abbey, BLM
Attachment 3: May 17, 2002, Letter from Robert Abbey, BLM, to Enrique Manzanilla, EPA

cc: Kathleen Clarke, BLM Headquarters, Washington, D.C.
Gerald Smith, BLM Battle Mountain Field Office
Allen Biaggi, Nevada Division of Environmental Protection
Stanley Wiemeyer, U.S. Fish and Wildlife Service, Reno
Anne Miller, EPA Office of Federal Activities, Washington, D.C.
Bernice Lalo, Battle Mountain Band of Te-Moak Tribe of Western Shoshone
John Mudge, Newmont Mining Corporation
Dinah Bear, Council on Environmental Quality

ATTACHMENT 1

EPA Detailed Comments on the Phoenix Mine Final EIS

The Phoenix Mine Final Environmental Impact Statement (EIS) establishes that this project may create a significant long-term acid mine drainage problem. According to the Final EIS, baseline groundwater quality has been affected by past mining activities in the project area, and groundwater currently exceeds maximum contaminants levels (MCLs) for several parameters, including arsenic, cadmium, copper, nickel, zinc, selenium, mercury, beryllium, lead, iron, manganese, aluminum, chloride, total dissolved solids, and low pH. The Final EIS states that the proposed mine closure and reclamation activities would not provide sufficient neutralizing material to prevent perpetual acid mine drainage from the site. The Proposed Action is predicted to result in further degradation of groundwater, including exceedences of MCLs for numerous parameters, including low pH, sulfate, and at least 19 other constituents. Surface water quality sampling has also demonstrated exceedences of drinking water standards for several parameters in several streams on or just downstream of the existing mine site. The most acidic surface waters occur adjacent to historic mining facilities in Iron Canyon and Butte Canyon. Surface waters, including springs and seeps in these areas, exceed drinking water standards for antimony, arsenic, beryllium, cadmium, copper, chromium, fluoride, iron, magnesium, manganese, mercury, nickel, nitrate, pH, sulfate, total dissolved solids, and zinc (Final EIS, p. 3.2-14 - 3.2-18). Battle Mountain Gold Company (BMG) has been collecting and treating acidic surface water in these drainages since 1998, and expects to continue doing so until mine closure.

A. FEASIBILITY AND EFFECTIVENESS OF THE PROPOSED MITIGATION

The *Contingent Long-Term Ground Water Management Plan* could provide acceptable mitigation assuming sufficient funds are available for implementation. However, the *Preliminary Cost Estimate for the Phoenix Project Contingent Long-Term Groundwater Management Plan ("Cost Estimate")* prepared for Battle Mountain Gold Company (BMG) by Brown and Caldwell does not demonstrate that adequate funding will be provided.

Based on BMG's *Cost Estimate*, BLM indicates the net present value of implementing the *Contingent Long-Term Ground Water Management Plan* is $408,000, and that this amount should be paid into a Long-Term Trust Fund at project startup in order to cover the costs of implementing that Plan. BLM indicates the proposed monitoring program during project operations would provide sufficient data to determine whether adjustments will be necessary to the current cost estimates or Long-Term Trust Fund; and that BLM can require BMG to make adjustments to the Long-Term Trust Fund if needed. BLM will also require that BMG post a $1 million certificate of deposit for 30 years to ensure that money is available to fully fund the trust should BMG default on additional payments into the trust which BLM deems necessary. Based on EPA's experience with costs and funding issues at mine sites with perpetual acid rock

drainage problems, we do not agree that the Long-Term Trust Fund and additional $1 million surety, as currently proposed, would be adequate to cover the cost of implementing the *Contingent Long-Term Ground Water Management Plan.* Newmont recently provided EPA with the cost estimating program used by Brown and Caldwell to develop its *Cost Estimate*. Based on our review of the *Cost Estimate* and our very brief review of the cost estimating program, EPA estimates that, in order to cover the cost of implementing the *Contingent Long-Term Ground Water Management Plan*, the mining company should pay $33.5 million into the trust fund at project startup.

EPA also believes that it will be very difficult for BLM to require BMG to make additional payments into the Long-Term Trust Fund due to, among other things, the significant increase in funds required and the amount of time that will pass until information sufficient to trigger such an increase becomes available. Furthermore, BLM's proposal does not assure that the cost of the mitigation will be paid by BMG, as vital details regarding the mechanics of the Long-Term Trust Fund have not been provided.

If off-site groundwater contamination could not be controlled, with a feasible mitigation program, consistent with our comments on the Draft EIS, the project will be environmentally unacceptable. EPA believes the proposed mitigation may be infeasible because $408,000 in the Long-Term Trust Fund at project startup may be inadequate to yield the funds necessary to implement the *Contingent Long-Term Ground Water Management Plan* at year 60 or earlier. Furthermore, EPA does not believe monitoring would provide sufficient data to determine whether adjustments are necessary, or that BLM will be able to make such adjustments, for the reasons discussed in Sections 2 and 4 below.

Our discussions with BLM over the past several months have related to: (1) treatment and monitoring costs; (2) net present value of treatment and monitoring costs; (3) mechanics of the Long-Term Trust Fund; and (4) adjustments to the Long-Term Trust Fund. Each of these issues is discussed below.

1. Treatment and Monitoring Costs

EPA believes that BLM's long-term costs are significantly underestimated. Based upon our review of the cost estimate and experience with similar projects, EPA has concluded that BLM should set aside more than three times the current estimated amounts for capital construction and operations and maintenance (O&M) for the long-term treatment activities by a third party and for appropriate contingencies. In addition, a fundamental assumption of the BLM financial assurance program is that the mine operator will not be available to fulfill its financial obligations. For that reason, BLM regulations require that reclamation costs be calculated based upon the assumption that the reclamation is performed by a third party paid by the federal government.

EPA is concerned that the high degree of uncertainty in the costs that BMG projects for extraction and treatment of the expected contaminated groundwater has not been addressed in the Final EIS. The groundwater flow modeling conducted by Baker Consultants assumed that the bedrock is a heterogeneous "porous medium," yet the bedrock in the project area is highly fractured and faulted. This simplified approach was used because of the lack of data at this stage of project planning. This approach introduces significant uncertainty and does not provide a conservative assessment. Faults and fractures in the bedrock create both barriers and conduits for groundwater flow and make it very difficult to predict velocity, direction, and pattern of a contaminant plume. Simulating ground water flow through fractured media is difficult, necessarily involves gross simplifications, and is inherently less accurate than modeling of porous media. Experts in the field do not agree on the applicability or accuracy of such simulations.

The modeling approach used, although reasonable at this stage of planning, would not be acceptable for a final design document. The uncertainties related to the modeling must include contingencies, such as those suggested by EPA in this attachment, for estimating the long-term costs of mitigation.

The uncertainties include:

1. The fractures and faults in the project area generally trend parallel to the predicted groundwater flow. The extraction wells may not capture the contaminant plumes if they travel past on a parallel track. The precise locations of wells to assure the capture of all contaminated groundwater in the fractured bedrock system is expected to be difficult to determine. Additional wells may be required in order to capture the contaminated flows. (The first set of extraction wells is proposed to be four wells. A 50 percent contingency would be enough for two more wells. This is not an unreasonable contingency and could be low).

2. The contaminant could reach the groundwater much sooner than 60 years if the fractures and faults act as conduits for flow.

3. The amount of water and contaminants reaching the wells could be greater, or could be more contaminated than predicted, increasing the costs of pumping, treating, and disposing of the water and treatment sludge. (For example, if the plant treats contaminated groundwater with higher concentrations than predicted, the *Contingent Long-Term Ground Water Management Plan* indicates that BMG would switch from sodium hydroxide neutralization to lime neutralization. This could double the cost of treatment).

BLM has estimated long-term capital and O&M costs in the *Preliminary Cost Estimate for the Phoenix Project Contingent Long-Term Ground Water Management Plan* (see table below). These costs include future average annual costs of $64,000 per year for monitoring, which would begin approximately at mine closure, and future average annual costs of $483,000 for extraction and treatment of contaminated groundwater, which would begin approximately 30 years after mine closure. BLM has also estimated the capital costs for facilities necessary to extract contaminated groundwater, treat it, and reinject the treated groundwater. Although information is limited in the *Preliminary Cost Estimate for the Phoenix Project Contingent Long-Term Ground Water Management Plan,* it appears that BLM cost estimates for several major components include: $659,000 for the groundwater monitoring wells to be constructed 20 years after mine closure; $731,000 for the groundwater extraction and injection wells to be constructed 30 years after mine closure; $2,060,000 for the treatment plant to be constructed 30 years after mine closure; and treatment plant O&M costs of $235,000 per year, as described below.

EPA's review of these estimates found that the future treatment and monitoring programs could cost more than 3 times BLM's estimate to construct and operate. For example, EPA believes a realistic cost for the treatment plant is $6.7 million, and a realistic cost for treatment plant O&M is $750,000 per year. The adjusted average undiscounted costs per year would be in the range of $1.8 million per year. However, BLM has not provided EPA with full details of the cost elements and assumptions used in the BLM cost estimate, so EPA's estimates may not be complete.

Monitoring & Treatment Activities	**BLM Estimate**	**EPA Estimate**
Treatment plant (capital costs)	$2,060,000	$6,700,000
Extraction & injection wells (capital costs)	$731,000	$2,400,000
Treatment plan O&M	$235,000	$750,000
Total annual costs for monitoring and O&M	$547,000	$1,800,000

EPA's review also concludes that BLM did not include all appropriate markups for third party construction of the necessary capital improvements and performance of monitoring and O&M as specified in BLM's applicable guidance (*Nevada BLM Bonding Process for Plans of Operations Authorized by 43 CFR 3802/3809,* September 2000). Costs associated with performance of construction and O&M by a third party should have included additional markups for contract administration consistent with requirements of the Federal Acquisition Regulations (approximately 20 percent), and provision for overhead for the third party (approximately 7.5 percent).

A few examples illustrate the deficiencies with the current cost estimate and indicate that not all costs specified in applicable guidance are included in BLM's cost estimates. BLM's estimated cost for purchasing lime is $72 per ton. At an EPA Superfund site, a private contractor purchases 7,000 tons of lime per year at $72 per ton. The contractor must also pay freight for delivery to the plant, taxes, administrative overhead and include a markup for profit that totals $28 per ton. To price this component of the treatment operations under BLM requirements, the price must include all costs (taxes and freight), an additional mark-up of 18 percent for contract administration, and include a mark-up for profit of 10 percent. The BLM cost estimate does not include the full lime price (since it excludes the costs for freight and taxes) or any of the appropriate markups for federal contracting and third party profit. Many of these items are also required by Nevada BLM for cost estimates. Id. Our review indicates that the cost estimate does not provide for these required elements for lime anywhere else in the estimate. This example leads us to believe that in general the cost estimate does not include all appropriate adjustments to base costs.

Similarly, BLM appears to underestimate labor costs. The cost estimate uses a labor markup of 1.2125. Based upon our experience with labor multipliers for long-term treatment plants, a more realistic and appropriate treatment plant multiplier that addresses all third party costs required for federal contracting would be 1.75 to 2.0. A detailed review also shows that BLM has only included required federal markups on items such as social security and medicare, but has not included markups for overhead and administrative costs that a third party would include in its pricing. These additional markups are necessary to provide an accurate and realistic cost estimate.

Our detailed review of the information provided by BLM also indicates that the alternative treatment approaches that may be required by the *Contingent Long-Term Ground Water Management Plan* are not factored into BMG's *Cost Estimate*. For example, the *Cost Estimate* indicates that continuous treatment with lime could be required if the acidic drainage is more concentrated than anticipated in the model (pp. 10-12). The costs for this type of treatment alternative would more than double the estimated annual O&M costs from $750,000 per year to $1,800,000 per year, for treatment costs alone. The actual cost estimate, however, does not include any funds to account for this risk (*Cost Estimate*, Appendix H). Rather than exclude this possibility, the estimate should use a weighted average to develop a more realistic estimate of expected costs.

EPA is concerned that BLM provides only a 10 percent contingency for all costs associated with the *Contingent Long-Term Ground Water Management Plan*. While consistent with guidance for BLM surface reclamation activities, this low rate is not appropriate for addressing the significant uncertainties associated with controlling a long-term groundwater problem of the magnitude expected under the proposed large-scale expansion of mining into acid-generating rock. BLM has extensive experience with mine reclamation activities which generally involve easily quantified costs, such as capping waste piles and moving known quantities of materials.

In contrast, the proposed long-term treatment remedy is similar to the process for a long-term clean-up at a Superfund site. The treatment of groundwater in perpetuity is subject to a wide range of uncertainties such as those produced by reliance on groundwater modeling of a future event, groundwater chemistry, flow rates, and treatment effectiveness. The uncertainty in this case is especially high due to the acid-generating nature of the rock and the scope of the mining that will occur. Given the more complicated and speculative nature of the mitigation, the low contingency used for simpler, more quantifiable projects is not appropriate.

The very low contingency used by BLM is a serious concern given the approach used to estimate costs. BLM's proposed perpetual treatment program has taken the most optimistic approach in each instance, and anticipates that installation of the minimum number of extraction wells and treatment of the minimum flow of contaminated groundwater are all that will be required. Based on years of experience with complex mining sites, EPA believes that, at this stage in the conceptual formulation of the proposed perpetual treatment activities, and in this extreme type of acid producing rock, it would be reasonable for BLM to include a 50 percent contingency to provide for a significant expansion of the extraction and treatment system. EPA and the U.S. Army Corps of Engineers developed "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study" (July 2000), EPA 540-R-00-002, OSWER 9355.0-75. Based on this guidance, a 25 percent contingency should also be included for normal design, and a 20 percent contingency should also be included for construction. Neither of these contingencies are included in the BLM cost estimates.

Finally, EPA is concerned that BLM provides only an 8 percent markup for all costs associated with engineering support. Based on 20 years of experience remediating mine sites, EPA would expect that markups for project management, design and construction management would total 26 percent or more.

> **Recommendation:** BLM should use the EPA values shown in the table above to calculate the net present value of implementing the *Contingent Long-Term Ground Water Management Plan*.

2. Net Present Value of Treatment and Monitoring Costs

BLM's predicted rate of return is overly optimistic. The foundation of BLM's long-term financial assurance program is the real investment return on the trust fund. For the reasons stated below, EPA believes BLM's real return rate is overly optimistic.

a. Taxes Reduce Net Returns.

The financial aspects of the Long-Term Trust Fund for the Phoenix project should be based upon the assumption that the company will not be available to pay taxes. However, the BLM analysis for this project assumes that Newmont is available to pay taxes and fees for the entire life of the project. If the site operator is not available to pay taxes, either the trust itself would have to pay taxes and fees, or the financial assurances could be converted into a federal trust of some kind (with no taxes being due).

The impact of taxes on the trust earnings is substantial. The rate of tax depends on a number of factors, including the legal structure of the trust and the type of investments in the trust. BLM has not provided information about the tax structure of the trust after insolvency of the operator. However, if the trust were to become a stand alone trust under section 468B of the tax code, the earnings of the trust would be subject to federal taxes at a rate in the range of 40 percent. A 40 percent tax would reduce the nominal return to 60 percent of actual earnings, but the real return would be even less than that. For example, a nominal return of 8 percent would yield an after-tax return of 4.8 percent. After inflation at 4 percent, the net real return would be in the range of 0.8 percent (4.8 percent minus 4 percent) without accounting for trust and investment fees. It is also possible for the trust to invest in tax free instruments, but that would affect the rate of return as tax free instruments generally have a lower yield than taxable ones.

If the corpus of the trust becomes federal funds after the operator becomes insolvent (for example on the theory that the federal government should be considered the owner of the funds), no taxes would be due on the growth of the funds after conversion (although back taxes may be due); however, if the trust is considered federal funds, the investments in the trust would be limited by federal rules, which would make the assumptions that underlie the BLM net present value analysis inapplicable.

> **Recommendation:** BLM should assume that Newmont or BMG will not be available to pay taxes on the trust account. This assumption should be factored into BLM's real return rate.

b. Management Fees Reduce Net Returns.

The net present value analysis performed by BLM also does not consider the impact of management fees and other trust expenses that affect the rate of return. Management fees vary considerably based on a number of factors, but it is important to consider their impact over time. Fees can range from 0.25 to 1 percent or more depending on the amount in the trust, the type of management and other factors. Wells Fargo Bank, which operates the second largest trading desk for fixed income instruments in the country, would charge an annual rate of 0.56 percent

per year on a trust that holds $40 million. If the trust held less than $2 million, the fees would be 1.3 percent. This amount leads to a direct reduction in the annual return.

> **Recommendation:** BLM should not assume that the company is available to pay these fees; rather, BLM should assume, as it does with respect to reclamation costs, that the site operator is not able to pay these costs and that government will be responsible to pay the costs from the financial assurance instrument. For this reason, BLM should deduct these costs from the annual earnings of the trust account. An assumption of at least 0.50 percent should be used, particularly if the trust holds less than $40 million.

c. Analysis of Economic Variables Includes No Margin of Safety.

The approach used by BLM includes zero margin for safety on the economic projections. Most of the variables discussed in the economic analysis are not static but change on a regular basis due to complex and interrelated factors. This variability increases the risk to adequately funding the project. For example, consider the situation where a project has to spend $3 every year in today's dollars. One might initially consider the trust to be fully funded if one expected a fixed real return of 3 percent and the trust contains $100. In that case, the trust would be expected to generate $3 in inflation adjusted dollars, and it can continue to do so because the principal remains at an inflation-adjusted $100. However, if market conditions cause the trust to generate only $2 per year for 10 years, the trust will consume more than $10 in principal. When market conditions return to "normal," the trust would start to earn 3 percent again; however, the trust will generate less than $2.7 dollars because the principal will be less than $90. At that point, the trust will continue to consume principal at a faster and faster rate, until the entire amount is gone. It is possible that a series of good years will follow and allow the fund to "catch-up," but the conditions required for that to be achieved are uncertain.

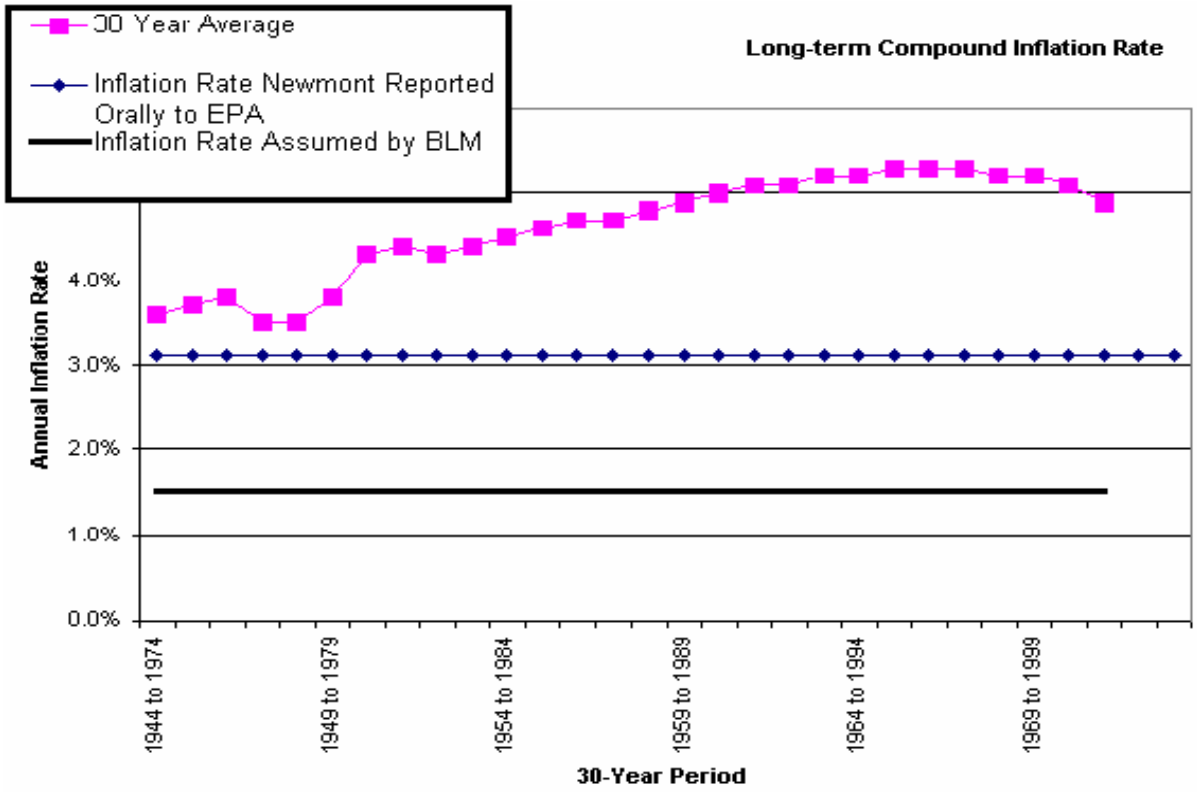
EPA understands that Newmont relied upon a deterministic approach to calculate the start value for the trust account. A deterministic approach relies on simple averages and does not take variability into account at all. If the correct average assumptions are used, the approach would provide only a 50 percent chance of adequate funding. A deterministic approach is not appropriate or realistic given the importance of using a conservative approach to provide adequate financial assurances and the certainty that the economic factors will be variable from year to year. Moreover, while the long-term nature of the project does have some averaging effect, an analysis of variability is still an important step to consider because the trust will have unavoidable expenses (treatment plant construction and operation costs) that could occur during periods of poor investment returns. We must assume that BMG is unable to meet those obligations or put more money in the trust fund because BLM anticipates that the trust fund will not be needed until long after BMG closes the site.

Recommendation: EPA recommends that BLM perform an appropriate Monte Carlo analysis, using an appropriate average and standard deviation for each variable, particularly to model the amount necessary from years 60 to 180. The model should rely upon the auto-correlated nature of inflation and the complex but clear relationship between inflation and investment returns. An appropriately conservative probability of success (80 or 90 percent) should be selected, with success being defined as meeting and maintaining an amount necessary to support perpetual treatment. This type of an approach would provide a more realistic assessment of whether the trust fund will be adequate to pay for perpetual treatment. We note that the model must be transparent and replicatable to ensure that the conclusions are valid and defensible.

d. Inflation Rate is Too Low.

Another key assumption for the net present value calculation is the projected inflation rate for the life of the project. The initial cost estimate assumes that inflation will have a compound rate of 1.5 percent per year over the life of the project. The basis for this figure has not been provided; however, it would appear to be inconsistent with any reasonable estimate of long-term inflation. Newmont has recently proposed orally that the United States rely on an inflation rate of 3.1 percent. We understand that figure is based on 75 years of inflation data.

EPA agrees that there is much uncertainty about what inflation rates will be in the future. We also believe that an assumption of 3.1 percent is more reasonable than an assumption of 1.5 percent. However, we believe that a more conservative rate of 4 percent is appropriate, based upon the inflation experience during the modern economic era – since World War II. This more conservative approach will provide a higher degree of confidence that an appropriate sum is set aside to for perpetual treatment. The period is also more likely reflective of our current monetary policy (which is not based on the gold standard) than the pre- World War II era. Since the end of World War II, inflation has never been at or below 1.5 percent for any 30- year period. Investment Dimensions 1926-2000, Dimensional Fund Advisors (2001) at 44-45. (DFA 2001). Since 1944, the compound inflation rate has never been less than 3.6 percent per year for any 30-year period and the average for the entire period is 4.1 percent. Over the last 30 years, inflation has an average compound rate of 4.9 percent. Id. The graph below illustrates the degree to which the BLM and Newmont inflation assumptions are inconsistent with inflation rates of the past 50 years.



We are currently in a period of relatively low inflation, so it may be appropriate to use a figure lower than the 4.9 percent average of the last 30 years, but the assumption BLM used for the cost estimate is not supported by the Final EIS and is inconsistent with historic patterns and currently available information. We believe that a figure of 4 percent would be acceptable in these circumstances. That rate is approximately equal to the long-term compound rate since 1944 of 4.1 percent.

Recommendation: We believe that the model should rely upon an average inflation rate of 4 percent.

e. Nominal Return Rate is Too High.

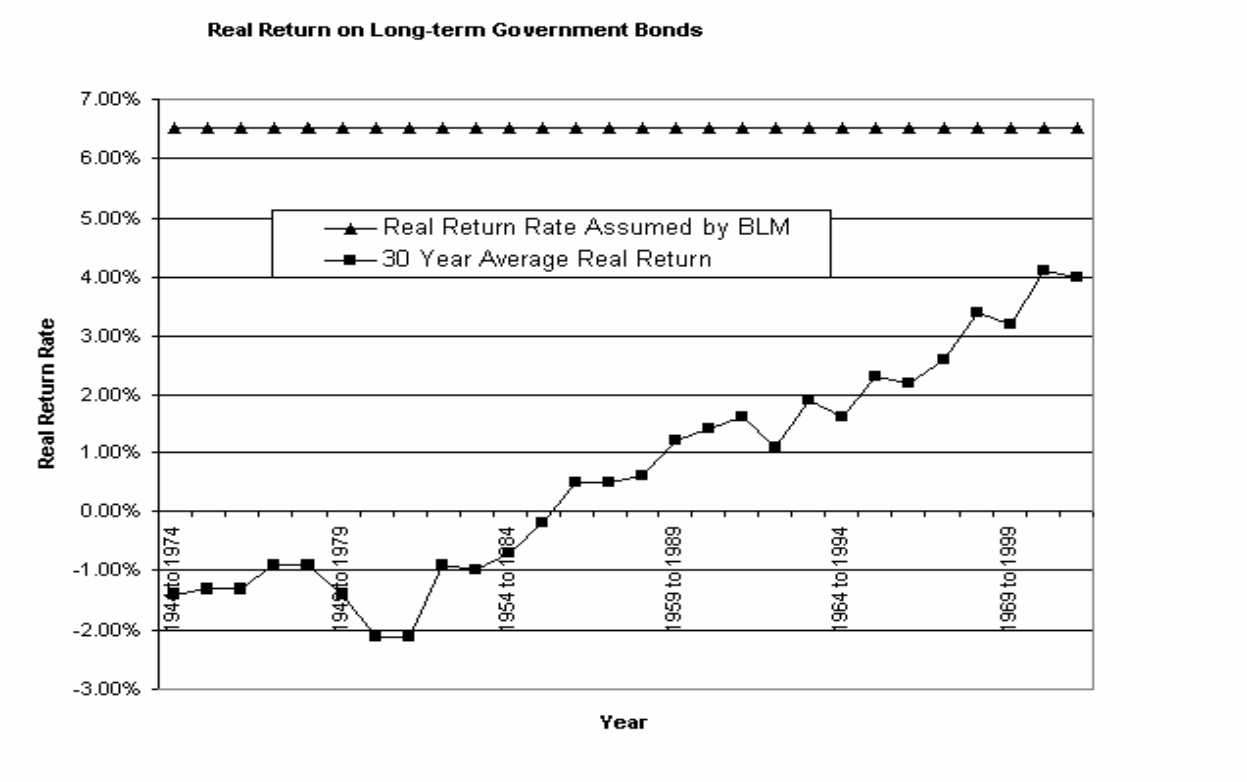
BLM has assumed that the trust fund will earn a nominal rate of return of 8 percent at the same time it assumes inflation will be 1.5 percent. Newmont has told EPA it believes the net present value calculation should be based on a nominal return rate of 9.8 percent. A nominal rate of return of 8 percent appears overly optimistic, particularly in periods of average or low inflation or if low risk investments are used. Since the prime objective in this matter is to determine the real rate of return, one must use consistent assumptions for inflation and the nominal return. The nominal return on a bond held to maturity is a function of the risk free real return rate, the risk

premium, and expected inflation. Thus, in periods of low inflation expectations the nominal rates are lower while in periods of high inflation expectations the nominal rates are higher; but in both high and low inflation environments, the real rate of return remains relatively constant within a range. This section discusses currently available rates and historic rates in the context of inflation.

The 8 percent assumption used by BLM is higher than the return rates available today on low risk fixed-income investments. Currently, AAA corporate bonds yield between 3.12 and 6.83 percent. Bloomberg Yield Curve Number 21 (AAA) (as of May 17, 2002). Longer-term bonds have a higher inflation risk because the coupon does not change in response to increasing inflation, so it is prudent to have a range of maturities in a bond portfolio. Since it would be prudent to have a range of maturities for the investments to manage inflation risk, the expected return on a blend of high grade bonds would be in the 5 percent range. The blended yield on a comparable series of government bonds would be lower.

EPA has also contacted several trust departments at major banks that handle these types of trusts. Senior portfolio managers in trust departments at major banks confirm that return rates in the 8 percent range are not currently available under current market conditions for conservative fixed-income instruments. These institutions also indicate that it is not appropriate to rely on a nominal return rate of 8 percent for long-term planning purposes in an average or low inflation environment.

Similarly, the average historic returns on low-risk fixed income instruments have been significantly less than 8 percent during periods of average inflation. See DFA at 50-51. The nominal return on long-term government bonds has averaged 5.6 percent since 1944. A review of data from the DFA indicates returns above 8 percent do not occur during periods of low inflation (such as the 1.5 percent used by BLM). While low risk bonds may have returns of 8 percent during periods of above-average inflation, the net real return on the bonds remains in the 2 percent range. For example, once inflation is taken into account, long-term government bonds have averaged 1.4 percent since 1944, with the 30-year average ranging between -2.1 and 4.1 percent. The graph below shows the extent to which the real return rate assumed by BLM is higher than the 30-year average since the end of World War II. For example, from 1944 to 1974, the 30-year average compound return on long-term bonds was -1.4 percent. The negative real return is due to the fact that after the bonds were purchased, inflation increased above the rate expected at the time the bonds were purchased. Similar risks exist today because currently inflation expectations are low so nominal bond returns are low. If inflation increases, long-term bond holders face the risk of negative real returns. All of these historic averages and currently available yields are significantly lower than the 6.5 percent real return assumed by BLM.



Actual data from historic returns on mine closure funds also indicates that the 8 percent or higher return rate may not be realistic. Barrick Goldstrike Mines Inc. established two post-closure funds in 1991 to pay for long-term monitoring and environmental contingencies at the Betze Project near Carlin, Nevada. The period 1991 to the present is considered to be an exceptional period not only for equities, but also for fixed income instruments like government and corporate bonds. In part, the returns have been highly favorable on bonds because the period is generally characterized as one of lowering inflation expectations and lowering interest rates. For example, since 1991, the average return on long-term government bonds over the last 10 years is 76 percent above average per year. DFA at 20-21. During this same period, the long-term contingency fund established by Barrick has earned on average 5.73 percent. The fact that this long-term trust fund earned only 5.73 percent over this highly favorable period indicates that the 8 percent proposed by BLM is not a reasonable or "conservative" assumption for long-term performance. During this period, inflation has averaged 2.7 percent, so that trust fund has earned 3.03 percent after inflation during a period of exceptional economic returns and declining inflation expectations. The 3.03 percent earned by the mining trust fund during this highly favorable period is less than half of the return rate proposed by BLM.

EPA understands that the high nominal return proposed by Newmont is based upon the assumption that the trust will be invested 70 percent in equities and 30 percent in bonds throughout the life of the trust. There are many reasons that EPA believes the net present value figure should be based upon investment in low-risk instruments and not equities. First, the underlying assumption that the company will not be financially viable should compel the conclusion that post-closure treatment, like reclamation, will ultimately be performed by a third party paid by the government. Since the government, at that time, will need to rely on the financial assurances to pay for perpetual treatment, the government would invest the trust fund like it does its own funds. Government rules generally do not permit BLM to invest public funds in the equities markets. Second, there are also public policy considerations for the executive branch of government owning a portion of private companies or otherwise controlling investment decisions. Third, stocks are inherently more risky than government bonds, so it is not appropriate to put money intended for the government to use to pay for long-term environmental needs into highly variable investments. Government bonds guarantee a nominal return over the life of the bond with zero default risk. The nominal return on stocks is uncertain. While historic averages indicate that stocks have generally had higher returns over time, it is widely accepted that historic performance is no guarantee of future performance. It is even possible that the growing perception over the last several decades that stocks are not risky over the long-term has in fact reduced the equity premium to a point that stocks will not yield higher risk adjusted returns than bonds. Moreover, stock selection introduces additional risk, such that reliance on historic averages may not provide an accurate indicator of performance even during that time period. These are just a few of the reasons that it is not appropriate to assume that the financial assurances for long-term treatment of groundwater problems will be invested in equities.

Newmont has stated orally to EPA that it believes the 6.5 percent real return is conservative because it is less than the 7 percent real discount rate discussed in OMB Circular A-94. That document applies to cost-benefit analysis for government planning, but does not answer the question presented here – namely if money is set aside in a trust fund and invested, what is an appropriately conservative approach for conducting a discount analysis. That document does not take into account taxes and investment fees or the risks introduced by mandatory withdrawal from a trust invested in variable instruments or stocks. In addition, the discount rates for government planning activities take into account factors other than investment returns, such as opportunity costs of funds to the federal government and other policy considerations. For these reasons, reliance on that circular is not appropriate for this type of analysis.

Even if it is assumed that the trust has some equity exposure, an assumption of 9.8 percent nominal return and a real return of 6.5 percent (as suggested by Newmont) is not a conservative assumption. A lower nominal return rate is appropriate, particularly given a mix between stocks and bonds and the need to be conservative in establishing the trust fund. For example, nuclear decomissioning trusts have been established pursuant to statute. Those trusts invest in a range of investments. A survey of Nuclear Decommission Trust Sponsors indicates an implied real rate

of return after taxes and fees generally in the range of 1 to 2 percent from the period of 1992 to 2000, an exceptional period for stock and bond performance. See Nuclear Decommission Trusts – 2000 Survey of Trust Sponsors at 5, NISA Investment Advisors, L.L.C. 2000 (nisanet.com).

> **Recommendation:** EPA believes that BLM should rely upon the types of investments listed in the BLM 3809 Regulations for reclamation funds to calculate the net present value of long-term water treatment operations. Those low-risk instruments provide a higher degree of assurance that the funds will be available to pay for treatment when necessary. Those instruments would be expected to have a nominal return in the range of 5 to 6 percent.
>
> BLM has both understated the rate of inflation and overstated the expected return on the fund. In addition, the approach does not take into account other factors that cause BLM to understate the amount necessary to fund the treatment activities. More appropriate assumptions based upon historic rates and currently available investment instruments would be 4 percent and 6 percent for inflation and nominal return rate. These factors lead to a more realistic real return rate projection of 2 percent after inflation. Taxes, fees, and an appropriate statistical model should also be considered and addressed by BLM.

f. The Unreasonably Optimistic Real Return Rate Significantly Underestimates Site Costs.

The effect of using more realistic economic assumptions leads to a profound increase in the amount needed to fund the post-closure activities. The funds needed at the start of the project depend on the factors identified above (the projected annual costs, the nominal return rate, the inflation rate, costs and fees and variability of those variables). The economic variables are combined to produce a discount rate to calculate the net present value of the future expenses. If one uses a fixed assumption for the discount rate and future costs, it is possible to predict the amount needed to fund the expected costs. Additional analysis is necessary to account for the variability of these factors, but this analysis provides a reasonable starting point. The table below shows the amounts that would be needed in the Long-Term Trust Fund to fund the post-closure activities at various discount rates. For purposes of showing the growth rates over time, the table shows the amount that would be necessary at these rates at the start of the project (2002 NPV Base Case) and the amount that would be necessary at these rates at year 20 (2022 NPV Base Case) and project year 60 (year 2062).

Year	2002	2022	2062
Real Return (net inflation, taxes and fees)	NPV Base Case	NPV Base Case (nominal dollars with 4% inflation)	NPV Base Case (nominal dollars with 4% inflation)

0.0%	$261,966,240	$565,847,078	$857,775,099
1.0%	$87,683,850	$184,593,755	$498,552,323
2.0%	$33,530,301	$84,285,567	$324,687,170
3.0%	$14,362,568	$43,034,308	$231,971,267
4.0%	$6,741,581	$24,036,682	$177,702,108
6.5%	$1,362,815	$7,451,477	$110,588,096
Proposed Surety Amount	$1,000,000	$1,000,000	

Assumptions for Table

- Remedy proposed by BMG would be technically feasible and effective.
- BMG groundwater model is correct.
- Monitoring starts in year 30 and costs $230,000 per year (including capital and O&M expenses).
- Treatment starts in year 60 and costs $1.9 million per year (including capital and O&M expenses).
- These figures are generally based on the BMG estimate, but include a contingency and markup by a factor of 3.27 based on more standard cost estimating procedures for a project of this type.
- The estimate also assumes that capital costs are amortized over the O&M period. For simplicity, we assumed that capital expenses add 10 percent to monitoring expenses and 20 percent to treatment expenses.
- Does not take into account standard deviation risks and variability, which would tend to increase the funding requirements.
- Costs are projected only through first 180 years. Perpetual model would increase the start amount by 2.5 percent (at a 3 percent discount rate) to 40 percent (at a 1 percent discount rate).

The table shows that, at a real return of 2 percent, the company should place $33,530,301 into the trust fund at the start of the project. This amount should grow to $84,285,567 by year 20 based on those assumptions. If those rates of growth and inflation continue forever and if no treatment is required until year 60, these funds would be just enough to pay for the projected treatment (using the EPA-adjusted figures shown in the table). The table also shows that the additional $1 million surety proposed by BLM would be only a small fraction of the additional amount needed by year 20. At that time, BLM would be required to ask the mining company for more than $80 million dollars, but it will have very little leverage to do so.

Although the figures shown above are significantly higher than the BLM projections, EPA believes that even the estimates outlined in the table may be overly optimistic, and that a risk remains that the project will not be fully funded. For example, a critical assumption of BLM is that the pollution problem created by this mine will not require any treatment for 60 years, by which time the mining will be complete, and the mining company established to perform this mining may no longer exist. The assumption that 60 years will pass before treatment is needed is based on a groundwater model developed by the mining company. We have not had the opportunity to conduct a rigorous review of the groundwater or geochemistry models, but will assume the modeling assumptions are reasonable for this stage of planning. Given large gaps in the data at this pre-mining stage, however, adding contingencies into the cost estimate would be

appropriate. As stated previously, the groundwater modeling referenced in the Final EIS assumed a porous medium even though the bedrock in the project area is highly fractured and faulted. This simplified assumption introduces significant uncertainty into the assessment, and cannot be considered to be a conservative assessment. In our experience it is not uncommon for models to be overly optimistic about the timing of such groundwater pollution problems. For example, modeling conducted in 1999 for the McCoy Cove mine, near the Phoenix project, projected a pit lake concentration of 120 milligrams/liter (mg/L) sulfate. The most recent monitoring report indicates 1,250 mg/L sulfate in the pit lake after one year of filling. This was due to an underestimation of the oxidation rate of the pit area.

In the case of the Phoenix Mine, BLM acknowledges that the timing and magnitude of the projected groundwater impacts are uncertain (Final EIS, p. 3.2-55). If the assumption that groundwater impacts will begin in year 60 errs by only 15 years (i.e., impacts begin in year 45), the amount needed in the Long-Term Trust Fund by year 20 increases by 33 percent (at 2 percent return) to more than 150 percent (at 6.5 percent return). This uncertainty should be evaluated and accounted for in the analysis.

These points have been raised with BLM on several occasions. In response, BLM will monitor the trust fund and require increases as appropriate. While we agree that monitoring field conditions and economic performance of the trust fund is important, as discussed in section 4 below, the approach suggested does not address EPA's concerns, particularly given the amount of time that will pass before such information becomes available and the significant financial shortfall that may exist by that time.

> **Recommendation:** (1) Prior to signing a Record of Decision, (ROD), BLM should perform additional analyses to determine the appropriate levels of funding for the Long-Term Trust Fund. EPA offers to assist BLM in this analysis. This analysis allows for a more meaningful dialogue about the required funding for the trust. We recommend the model examine the effect of differing start dates for water treatment. This approach should lead to a more appropriate figure for the Long-Term Trust Fund. A shift in only 15 years of the start date (from year 60 to year 45) results in BLM holding less than half the financial assurances needed to pay for long-term treatment, even if all of the other BLM assumptions are correct (such as the real return of 6.5 percent).
>
> (2) If BLM does not adjust the initial financial assurances before issuing the ROD for this project, EPA recommends that BLM commit in the ROD to engaging an independent third party to complete a full analysis of the costs and financial predictions associated with BMG's ability to implement the *Contingent Long-Term Ground Water Management Plan* before the project's first triennial review. The reviewer should have appropriate expertise in long-term engineering design, construction, and O&M costs and long-term financial planning. Information provided to the reviewer should include EPA's cost and

financial estimate, included in this attachment, as well as information from BLM. BLM should circulate the reviewer's report to interested parties, including EPA, for review and comment. The ROD should include a commitment to require a timely increase to the trust fund to the amount determined necessary by the third party.

3. Mechanics of the Long-Term Trust Fund

Critical information regarding the adequacy of the Long-Term Trust Fund to cover perpetual treatment costs has not been provided. Specific details of the Long-Term Trust Fund are critical to determining whether sufficient funds will be available to implement the *Contingent Long-Term Groundwater Management Plan* in perpetuity. These include: (a) requirements for timing of payments into the trust fund; (b) how BLM ensures that the trust fund is bankruptcy remote; (c) acceptable financial instruments (such as those specified in 43 CFR 3809.555); (d) legal structure of the trust for tax purposes; (e) who will pay the taxes on trust earnings and trust fees and expenses; (f) how taxes and trust fees will be paid on the trust if the mining company goes out of business; (g) who will make investment decisions if the operator is no longer viable; (h) if the federal government controls the investment decisions, what legal and ethical issues arise from BLM controlling investment decisions about investments in private companies, voting stock and similar issues if the trust owns stock; (i) the identity of the trust fund beneficiaries; and (j) the identity and corporate structure of the operator with responsibility/ liability for financial assurance at this site. The level of detail provided by BLM to date does not allow EPA to conclude the financial assurances will be satisfactory. We have requested details on these aspects of the project [Attachment 2], but have not yet received them from BLM [Attachment 3].

Recommendation: Prior to signing a ROD, BLM should address each of the points above to enable appropriate review of these important issues. BLM should also ensure the Long-Term Trust Fund and its earnings are established to ensure that the corpus and earnings are bankruptcy remote. The federal government should have a perfected security interest in the trust and its earnings.

BLM has stated that if monitoring indicates that the modeling underestimates groundwater flow or leachate concentrations beneath the site, they will require BMG to increase the Long-Term Trust Fund by an appropriate amount. We agree that this is an important commitment and should, therefore, be included in the ROD. In addition, BLM should require Newmont to act as guarantor of these financial assurance amounts so that BLM could look to Newmont if BMG is unable to meet its financial assurance obligations. We understand that BMG is a wholly owned subsidiary of Newmont, and that Newmont believes that it would be liable for environmental problems created by its wholly owned subsidiary. This understanding and commitment should be documented in the ROD and other documents.

The ROD should include these critical details of the trust fund once BLM has determined how these factors will affect the ability of the trust fund to cover the costs of perpetual monitoring and treatment at the mine.

4. Adjustments to the Long-Term Trust Fund

BLM's wait-and-see approach to adjusting the Long-Term Trust Fund does not assure adequate funds will be available to cover the costs of implementing the *Contingent Long-Term Groundwater Management Plan* in perpetuity. The primary response of BLM to EPA comments has been that BLM can, over the course of the project, adequately adjust the cost estimates and require the mining company to adjust the Long-Term Trust Fund, if need be, based on its proposed annual review of groundwater monitoring data and triennial review of trust fund status. There are several problems with this approach.

First, monitoring technical or economic data will not address the problems raised by EPA above. Second, if the data indicate that the cost estimate is too low, those data may not become available for several decades, at which point BLM may have no effective way of securing those funds from the mining company. Third, all costs of this project, including the cost of long-term treatment, must be evaluated before the project begins so that the mining company and BLM can make an informed decision about whether the project can proceed on a cost-effective basis, or whether an alternative (such as improved reclamation) should be reconsidered. BLM has a responsibility to consider whether the project would be economically viable, based on all potential mining and post-mining costs. These points are further discussed below.

a. Monitoring technical or economic data will not address the problems identified by EPA.

We agree it will be important to monitor the trust fund to ensure that an appropriate amount of funding is provided, but monitoring technical conditions will not solve the problems identified by EPA in a timely manner. Even without adverse monitoring results, we believe the trust is seriously underfunded, based on the treatment costs outlined above. If monitoring revealed acid generation to be *more* serious than predicted by BLM's modeling, the cost estimate would be even higher than the current EPA projections.

Similarly, monitoring the performance of the trust fund investments will not remedy the problems identified here because of the long-term nature of this project. For example, EPA has determined that, in order to cover the costs of implementing the *Contingent Long-Term Ground Water Management Plan*, the Long-Term Trust Fund should grow to approximately $84 million by project year 20. The need for $84 million in the trust fund at year 20 is based on the conditions that will exist from year 20 to 180, not on the conditions that exist in the first 20 years. That is, if the first 20 years are a very good period for fixed income instruments, during that period the fund may earn an above average real return of 5 percent due to unusually favorable economic conditions. In that case, the mining company may conclude that an amount much less than $84 million is needed in the trust account at year 20. However, if economic conditions return to average conditions from year 20 to 180, the trust fund would still require $84 million at year 20 to pay the expected costs starting in year 60, and the failure to have those funds in the trust would result in a significant shortfall.

Another factor that has not been adequately considered, and cannot be resolved through monitoring the fund, is the cyclical nature of economic returns. Favorable conditions are often followed by poor economic conditions due to the cyclical nature of the economy. Over the past ten years, fixed income instruments have exceeded historic real returns by a meaningful amount due to declining interest rates and declining inflation. However, we are now in a low-interest rate environment with below average inflation expectations. When inflation and interest rates rise, long-term bonds purchased today will decrease in value and real return. For example a long-term bond yield of 5 percent would earn zero real return if inflation increased to 5 percent.

For these reasons, among others, monitoring the economic performance of the trust fund as proposed by BLM will not remedy the problems identified here.

b. The wait-and-see approach suggested by BLM will make it very difficult to secure appropriate financial assurances in the future.

The BLM model predicts an extremely long period before environmental problems materialize. As a consequence, it is likely that monitoring data that supports a change in the cost estimate will not be available for at least several decades. In fact, most of the EPA technical comments relate to the cost estimate for long-term treatment. BLM currently predicts that the design for the treatment remedy will not be developed in detail until year 60. By that time, we calculate that the current cost estimate may require an increase of more than $500 million. Rather than face that potential shortfall, we believe it is appropriate and prudent to require the funds be put aside today so that they can grow to an appropriate level when they are needed.

Similarly, monitoring data may indicate that the groundwater model is overly optimistic in terms of timing for treatment or the nature of the contaminants to be treated. In that case, a meaningful increase in the treatment costs could be justified. The BLM model suggests that data of this type would not be available for several decades. By that time it may be financially infeasible for the company to supplement the trust fund.

As discussed above, deferring payments for several decades would require very large sums to be paid by the company. We do not believe BLM would have an effective way to require the company to increase the Long-Term Trust Fund at a distant future date.

Adjustments to the fund or the surety could not be made if the company is not financially viable in the future. It is unclear how BLM could effectively enforce such an increase to the Long-Term Trust Fund in excess of the $1 million surety (a) during project operations, (b) after project closure, and (c) if BLM discovered the need for such increases after the operator went bankrupt. Generally the only asset of a mining company such as BMG is the mine itself, which over time can become a liability, not an asset. The parent corporation will generally attempt to shield itself from liability through corporate walls. Unless the documents require a corporate guarantee in addition to all other financial assurances, there is a significant risk that the parent Newmont would have no long-term obligations at this site. Even a corporate guarantee from Newmont does not ensure Newmont's continued financial viability. BLM and Newmont have not provided any information regarding this issue.

BLM stated that after BMG has met its reclamation obligations at each phase, BLM can transfer any unused portion of the reclamation bond into the Long-Term Trust Fund if the fund needs to be increased. We have four fundamental issues with BLM's approach. First, the purpose of the reclamation bond is to cover the cost of reclamation in the event that the operator goes bankrupt and cannot fulfill its reclamation obligations. The reclamation bond must be relied upon for this function and should not be relied upon for any other function. Second, even if the operator

reclaims the site, there may not be any unused portion of the bond remaining. Third, it is unclear how BLM would be able to keep any portion of the bond if the area meets water quality standards for one year without needing additional treatment that year, and given that BMG will have established a long-term trust fund. The preamble to the final rule regarding 43 CFR 3809.591 states:

> Paragraph (b) states that BLM will release up to 60 percent of a financial guarantee for a portion of a project area when BLM determines the operator has successfully reclaimed that portion of the project area. Paragraph (c) states that BLM will release the remainder of the financial guarantee when we determine the operator has successfully completed reclamation, if the area meets water quality standards for one year without needing additional treatment or if the operator has established a long-term funding mechanism under Sec. 3809.552(c).

Fourth, BLM has stated that it would be unable to refuse release of, and transfer to a long-term fund, a surety (i.e., which is not cash, certificates of deposit, or letter of credit). It is unclear whether BLM could require BMG to post a significant portion of its reclamation bond in cash, certificates of deposit, or letter of credit.

EPA understands from its discussions with Newmont that it believes that BLM cannot transfer the financial assurances for reclamation to the post closure trust fund, since Newmont believes that BLM is obligated to release the financial assurances once the tasks defined as reclamation are complete.

> **Recommendation:** BLM should commit in the ROD to a process to ensure that additional payments will be made into the Long-Term Trust Fund should BLM annual and triennial reviews reveal the need for additional funds. The ROD should identify specific triggers and standards that would require the owner/operator to increase the Long-Term Trust Fund, or allow for BLM to transfer money from any unused portion of the reclamation bond into the trust fund. BLM should clarify in the ROD its interpretation of bond release requirements under 43 CFR 3809.591 and indicate whether BMG would be required to post a portion of its reclamation bond in cash, certificates of deposit, or letter of credit, and what portion of the bond that would be required to be.

c. The wait-and-see approach prevents a full analysis of whether project is cost effective.

EPA also believes that the wait-and-see approach proposed by BLM misses an important opportunity to ensure that all project costs are internalized to the company before a commitment is made to proceed with the project. All costs of mining, including the cost of long-term treatment, should be evaluated before the project begins so that the mining company and BLM can make an informed decision about whether the project can proceed on a cost-effective basis.

This approach could lead BLM or the project proponent to evaluate whether an alternative approach such as improved reclamation should be reconsidered. If a thorough analysis of the long-term costs is deferred until additional data become available, BLM misses its opportunity to make a fully informed decision about the project and its economic viability.

> **Recommendation:** For the reasons stated above, it is critical to establish appropriate levels of financial assurances now and not rely on the need to increase the amounts at a later date.

B. RECLAMATION ACTIVITIES

In our comments on the Draft EIS, we raised several concerns regarding proposed reclamation and closure of the Phoenix Mine. These issues should be resolved before BLM issues the Plan of Operation. The ROD should include new reclamation measures that have been added to the Phoenix Mine proposal since publication of the Final EIS.

The Final EIS does not address EPA's concern that runoff from the cap would exceed drinking water standards. Response 1-19 in the Final EIS discusses how the elevated metals in soil would affect plant growth. EPA remains concerned that the stormwater runoff from the capped waste rock will exceed water quality standards for drinking water or other uses and that there will not be adequate cap rock of suitable quality for the Phoenix project.

The Final EIS (Response 1-17) states that based on the extraction schedule, sufficient non-acid-generating waste rock for capping requirements will be available throughout the life of the project. However, according to the Final EIS (p. 3.2-36), "[t]he results of the kinetic tests indicate that most of the rocks in the project area directly associated with mining operations (pits and waste rock) have the potential to generate acid rock drainage." We remain concerned that net neutralizing rock will not be available in sufficient quantities throughout the project to provide a five-foot cap on site facilities.

The Final EIS lacks sufficient characterization of the borrow source to ensure that this source will provide an acceptable cap amendment with respect to geochemistry and geotechnical properties.

> **Recommendation:** BLM should calculate the volume of cap material necessary to prevent exceedences of water quality standards in runoff, identify the volume of borrow material that may be needed, and bond for the additional amendment, including additional testing and transportation costs. This information should be included in the ROD.

The borrow source should be thoroughly characterized so that realistic cost adjustments to the reclamation bond, including costs of importing material from other sources, can be made prior to the ROD. This information should be included in the ROD.

C. THE NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA) establishes our national environmental policy and goals for the protection, maintenance, and enhancement of the environment. Based on EPA's statutory responsibilities under the Clean Water Act and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), EPA believes that BLM's proposal does not meet the intent of NEPA and we continue to believe that the Final EIS is inadequate. If the proposed mitigation is significantly underfunded and, therefore, infeasible, off-site groundwater contamination would not be controlled, and the Federal government would inherit an enormous financial burden to mitigate the problem. BLM's proposal does not include the use of all practicable financial assurances to promote the general welfare. To fulfill its NEPA obligations, BLM should require BMG to provide adequate financial assurance that the *Contingent Long-Term Ground Water Management Plan* will be implemented when necessary after mine closure.

NEPA requires that all relevant information concerning environmental impacts be disclosed to the public before decisions are made and before actions are taken. 40 CFR 1500.1 (b); see also 40 CFR 1505.1(d), which requires that relevant documentation accompany a proposal through existing agency review processes so that agency officials use the statement in making decisions, and 40 CFR 1506.6(f), which requires documents underlying EISs to be made public. Agencies shall ensure the professional integrity of the discussions and analyses, and identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the EIS. 40 CFR 1502.24. Moreover, no material may be incorporated by reference unless it is reasonably available for inspection by potentially interested persons within the time allowed for comment. 40 CFR 1502.21.

We believe the information we requested in our Draft EIS comment letter is relevant and required for several reasons. First, the viability of the post-closure plan is a critical factor in whether this project may be considered environmentally acceptable. Second, EPA believes this information is essential for an adequate analysis of the proposed project, because it could make the difference between a project sufficiently managed over the long-term by the site operator, or an unfunded/under-funded contaminated site that becomes a liability for the Federal government, e.g, under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Third, the economic viability of the proposed project, including the cost of long-term treatment, should be evaluated before the project is authorized so that BMG and BLM can make an informed decision about whether the project is cost-effective.

The Final EIS presented a very general summary of the long-term cost estimates and the Long-Term Trust Fund. BLM provided EPA with BMG's *Cost Estimate* and a December 14, 2001, letter from Newmont describing in outline form the Long-Term Trust Fund. However, BLM did not release this information to the public until after the close of the comment period. The information supported by these documents forms the basis of BLM's position that the proposed Long-Term Trust Fund will be adequate to implement the *Contingent Long-Term Ground Water Management Plan*. This information may be used by BLM to select a project alternative and to determine whether the action will meet environmental policies, regulations, and standards. EPA believes that by not releasing these documents publicly during the public comment period, BLM did not meet NEPA's requirements that all relevant information that forms the basis for an agency's decision be disclosed to the public for review and comment.

> **Recommendation:** BLM should prepare a Supplemental Draft EIS and make all relevant information available to the public during a public comment period, in accordance with NEPA and CEQ's NEPA Implementation Regulations at 40 CFR 1502.9(c).

D. THE SURFACE MANAGEMENT REGULATIONS FOR SURFACE MINERAL OPERATIONS AT 43 CFR 3809

Historically, mining projects have resulted in the expenditure of billions of dollars by the government for environmental cleanups. There are many examples of large and well capitalized mining companies going bankrupt before their responsibilities for environmental cleanups could be satisfied. In light of this history, BLM recently finalized a new provision in its Surface Management Regulations for Surface Mineral Operations at 43 CFR 3809 authorizing BLM, when it identifies a need for it, to require operators to:

> Establish a trust fund or other funding mechanism available to BLM to ensure the continuation of long-term treatment to achieve water quality standards and for other long term, post-mining maintenance requirements. The funding must be adequate to provide for construction, long-term operation, maintenance, or replacement of any treatment facilities and infrastructure, for as long as the treatment and facilities are needed after mine closure. BLM may identify the need for a trust fund or other funding mechanism during plan review or later. [43 CFR 3809.552(c)]

The purpose of this new provision is to protect the public from liability for the cleanup, and BLM has identified the need for such a fund to be established for the Phoenix Mine. As explained above, however, the funding currently proposed for the Long-Term Trust Fund would not be adequate to provide for construction, long-term operation, maintenance, and replacement of treatment facilities and infrastructure, for as long as the treatment and facilities are needed after mine closure. Moreover, the mechanisms BLM proposes to use to adjust the Phoenix Mine

Long-Term Trust Fund over the life of the project are inadequate to assure that the *Contingent Long-Term Ground Water Management Plan* would be implemented.

The Phoenix Mine will be the first hardrock mine that, because of anticipated acid mine drainage, will include post-closure financial assurance under the new rule. BLM's approach in calculating long-term costs and determining the mechanics of the Phoenix Mine Long-Term Trust Fund will be an important precedent as BLM demonstrates how it will apply the new rule. There are innumerable mines across the country that have created perpetual pollution problems. This issue is likely to arise at many other mines on federally managed lands. Given the magnitude of the Phoenix Mine and its anticipated problems, BLM's approach to projecting costs and establishing a financial assurance instrument for the Phoenix Mine is not based on conservative estimates and significantly understates the Federal government's liabilities.

> **Recommendation:** EPA would like to assist BLM in developing a process for developing accurate post closure costs and acceptable trust fund mechanics, based on our extensive work on establishing trust funds at mining Superfund sites.

EXHIBIT C

Roger Flynn
Jeffrey C. Parsons
WESTERN MINING ACTION PROJECT
2260 Baseline Road, Suite 101A
Boulder, CO 80302
(303) 473-9618
Fax (303) 786-8054

Nicole U. Rinke
WESTERN MINING ACTION PROJECT
505 South Arlington Ave., Suite 110
Reno, Nevada 89509
(775) 337-2977
Fax (775) 337-2980

Attorneys for Petitioners/Appellants

STATE DIRECTOR
NEVADA STATE OFFICE
BUREAU OF LAND MANANGEMENT

GREAT BASIN MINE WATCH; and WESTERN SHOSHONE DEFENSE PROJECT, Appellants, v. U.S. BUREAU OF LAND MANAGEMENT; and GERALD M. SMITH, Field Manager Battle Mountain Field Office, Respondents.	)	Petition for State Director Review and Stay of the Record of Decision and Plan of Operations Approval for the Phoenix Project, Battle Mountain Field Office, Battle Mountain, Nevada EIS # NV063-EIS00-28 POO # NVN-067930

PETITION FOR REVIEW TO THE STATE DIRECTOR AND REQUEST FOR STAY OF RECORD OF DECISION AND APPROVAL OF PLAN OF OPERATIONS

Great Basin Mine Watch (GBMW), and the Western Shoshone Defense Project (WSDP), by and through their undersigned attorneys, hereby **request State Director Review and Stay of the Phoenix Project Final EIS, Record of Decision and Plan of Operations Approval, EIS # NV063-EIS00-28; Plan of Operations # NVN-067930** issued by BLM Battle Mountain Field Office Field Manager Gerald M. Smith on November 28, 2003. This Request/Petition was faxed and sent via overnight delivery (next business day) on March 19, 2004, and is therefore timely. *See* 69 Fed. Reg. 7792-93 (Feb. 19, 2004). Petitioners also request a meeting with the State Director regarding this Petition.

INTRODUCTION

Appellant Great Basin Mine Watch (GBMW) is a nonprofit organization based in Reno, Nevada that is concerned with protecting the Great Basin's land, air, water, wildlife and communities from the adverse impacts of hardrock mining. GBMW is a coalition of environmentalists, ranchers, and Native Americans dedicated to reforming the hardrock mining industry and the agencies that regulate them to protect the land, air, water and Native American resources of the Great Basin. Members of GBMW have used, enjoyed, and valued the area of the proposed Phoenix Project for many years. Members of GBMW hike, view and photograph wild plant and animal life, and generally enjoy using the area of the proposed project for recreational and aesthetic purposes. These uses will be adversely affected by the proposed operations. GBMW submitted comments to the BLM regarding the Draft EIS for Phoenix.

Appellant Western Shoshone Defense Project (WSDP) was created in 1991 under the direction of the Western Shoshone National Council, a traditional government of the Western Shoshone people. Its mission is to protect and preserve Western Shoshone rights and homelands for present and future generations based upon cultural and spiritual traditions. WSDP staff

operate under the guidance of acting director Carrie Dann, the Western Shoshone National Council, whose members represent various Western Shoshone communities and organizations, and a Community Advisory Board with members from five Western Shoshone communities.

The Phoenix Project is located entirely within the territory of the Western Shoshone Nation, recognized in the 1863 Treaty of Ruby Valley. Members of WSDP continue to use the Project site and adjacent lands for hunting, gathering, religious, cultural, and other traditional uses. These uses will be adversely affected, if not outright prohibited and obliterated, by operation of the Phoenix Project. The WSDP has been extensively involved with the numerous permits and decisions regarding the Phoenix Project.

ARGUMENT

I. THE BLM VIOLATED THE NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

A. The BLM Failed To Consider A Legitimate "No Action" Alternative.

The BLM's consideration of the No Action alternative in this case fails to accurately portray the status quo. In particular, and as discussed in detail below, the FEIS describes the No Action alternative as one that would not comply with federal law with regard to Newmont's duty to fully reclaim the existing mine site should the proposed expansion not be approved or otherwise not go forward to completion as planned. Instead, in an apparent attempt to downplay the significant impacts of the proposed expansion with regard to increased contamination of groundwater, the BLM sets forth its No Action alternative as one that would result in serious groundwater pollution. Due to the federal and state law requirements mandating full reclamation of the current mine site, the situation described by the BLM could not legally be allowed.

The National Environmental Policy Act (NEPA), 42 U.S.C. 2331, et seq. and implementing regulations require that federal agencies analyze a "no action" alternative. 40 CFR § 1504.14(d). The federal courts have also made clear that, "[i]nformed and meaningful consideration of alternatives -- including the no action alternative -- is thus an integral part of the statutory scheme." Bob Marshall Alliance v. Hodel, 852 F.2d 1223, 1228 (9th Cir. 1988), *cert. denied*, 489 U.S. 1066 (1989) (citations and emphasis omitted), *cited in* Alaska Wilderness Recreation and Tourism v. Williams, 67 F.3d 723, 729 (9th Cir. 1995).

In this case, the BLM has failed to conduct the required "informed" consideration of the No Action alternative because the agency unreasonably and arbitrarily characterized it as likely to result in serious groundwater and surface water pollution. The comments provided by the EPA on the mine project identified specific concerns with regard to the BLM's inadequate analysis and inaccurate characterization of the No Action alternative. The EPA stated:

> The DEIS only evaluates two alternatives – the Proposed Action and No Action. Pursuant to 40 CFR 1502.14, the EIS should rigorously explore and objectively evaluate all reasonable alternatives. Although it appears that several alternatives were considered, most were eliminated from detailed analysis. It appears that a few additional alternatives may be reasonable and warrant further exploration. The revised or supplemental DEIS should address the alternatives discussed below.
>
> The DEIS does not include an alternative that addresses clean up of current groundwater and surface water at the proposed mine site. The DEIS (p. 2-58) states that the No Action Alternative would have significant adverse impacts to water and geochemistry from the development of acidic pit lakes and groundwater degradation from existing waste rock facilities. BLM indicates its preference for the Proposed Action because it "provides greater assurance that these impacts would not occur, or would be mitigated." It is unclear why and how the Proposed Action provides greater assurance regarding this mitigation than the No Action Alternative. The DEIS (2-11) indicates that the requirements of the Water Pollution Control Permit and related work plans dictate how BMG would manage low quality water at the site. **EPA believes that BMG/Newmont is responsible for cleaning up contaminated groundwater or surface water resulting from the existing project *independent of the proposed project*; and that a massive expansion of the project, which would degrade water quality further, is *not* justified simply because current permits do not require BMG to conduct proper closure and/or post-closure activities at the existing mine.** The revised or supplemental DEIS

> should discuss how, under existing State and Federal regulations, BMG would be responsible for preventing acidic pit lakes and degradation of groundwater at the current mine and under the No Action Alternative, and what ability BLM or the State of Nevada has to require measures to either prevent or mitigate these impacts.

May 4, 2001 EPA Comments, at 2-3; FEIS Appendix C, Letter 1 (italics in original, bold emphasis added).

In direct response to these comments from the EPA, the BLM stated:

> Regarding the alternative to clean up existing contaminated ground water and surface water at the mine, the BLM concurs with the USEPA that BMG is responsible for cleaning up contaminated ground or surface waters at the site, independent of the proposed project. **The No Action alternative would include the clean-up of existing contaminated waters as well as reclamation of existing facilities at the Battle Mountain Complex.** These regulatory requirements are included in BMG's approved State of Nevada permits for the current operations, as described in Section 2.3.1 of the EIS. Section 2.3.2 of the EIS describes the reclamation and closure requirements for the approved Reona Project and for other existing facilities in Copper Canyon. The Proposed Action is preferable, however, because it would provide a single comprehensive plan for addressing these impacts. For example, closure and reclamation of the historic waste rock and tailings facilities are incorporated into the operations included in the Proposed Action.

BLM Response to Comment 1-7, FEIS Appendix C (emphasis added).

Thus, the BLM confirms in this response to EPA that regardless of whether the proposed Phoenix expansion is approved or not, BMG has an unavoidable legal obligation to ensure full reclamation and cleanup of any contaminated groundwater or surface waters at the mine site. Indeed, BLM flatly states that "The No Action alternative would include the clean-up of existing contaminated waters as well as reclamation of existing facilities at the Battle Mountain Complex."

However, in identifying the preferred alternative and in justifying the selection of the preferred alternative in the FEIS, the BLM entirely contradicts its own assertions:

> The selection of the Proposed Action as the BLM's preferred alternative rather than the No Action alternative is based on the impacts associated with water resources and geochemistry, and social and economic values. **The No Action alternative potentially**

> **could have significant adverse water resources and geochemistry impacts (Section 3.2.2.2) from the development of acidic pit lakes and ground water degradation from existing waste rock facilities.** The Proposed Action *with the inclusion of the Contingent Long-term Groundwater Management Plan* provides greater assurance that these impacts would not occur, or be mitigated.

FEIS Summary, at xi (italics in original, bold emphasis added). Thus, the BLM has mischaracterized the No Action alternative in justifying its selection of the Proposed Action.

Indeed, the BLM goes so far in its attempt to bolster the Proposed Action that it actually denies that there is any plan to clean up the currently existing ground and surface water contamination:

> The geochemical studies have determined that the vast majority of the waste rock material is potentially acid generating. Modeling results indicate that infiltration through the waste rock pile could eventually degrade ground water quality beneath and downgradient of these facilities. **There is currently no plan in place to mitigate the predicted long-term infiltration from the waste rock facilities. In addition, there is no proposal or requirement for long-term monitoring of ground water quality either at or downgradient of the facilities. Therefore, under the No Action alternative, there is the potential for long-term impacts to ground water quality during the postclosure period.**

FEIS Summary, at ix (emphasis added).

Taking all of the above statements together, it becomes clear that the BLM is attempting to have it both ways. The agency admits (as it must in order to ensure compliance with state and federal law) that the No Action alternative includes a full clean up of the mine site. Yet, BLM turns right around and claims that the No Action alternative would result in serious long-term ground and surface water contamination – in a thinly-veiled attempt to make its Proposed Action look like the environmentally preferred course. This failure to portray an informed and accurate assessment of the No Action alternative set an illegitimate baseline for analysis of the Project, violates NEPA, and highlights the arbitrary and capricious nature of the BLM's decision in this case.

B. The BLM Failed To Adequately Consider All Reasonable Alternatives

Apart from the failure to accurately characterize and analyze the No Action alternative, the BLM violated NEPA by not considering a reasonable range of alternatives to the proposed action. NEPA requires that federal agencies provide a detailed evaluation of alternatives to the proposed action in every environmental impact statement. 42 U.S.C. § 4332(C)(iii); 40 CFR § 1502.14(a). This discussion of alternatives is essential to NEPA's statutory scheme and underlying purpose:

> The goal of the statute is to ensure "that federal agencies infuse in project planning a thorough consideration of environmental values." The consideration of alternatives requirement furthers that goal by guaranteeing that agency decision-makers "[have] before [them] and take[] into proper account all possible approaches to a particular project (including total abandonment of the project) which would alter the environmental impact and the cost-benefit balance." NEPA's requirement that alternatives be studied, developed, and described both guides the substance of environmental decision-making and provides evidence that the mandated decision-making process has actually taken place. Informed and meaningful consideration of alternatives -- including the no action alternative -- is thus an integral part of the statutory scheme.

Bob Marshall Alliance v. Hodel, 852 F.2d 1223, 1228 (9th Cir. 1988), *cert. denied*, 489 U.S. 1066 (1989) (citations and emphasis omitted), *cited in* Alaska Wilderness, 67 F.3d at 729. Indeed, NEPA's implementing regulations recognize that the consideration of alternatives is "the heart of the environmental impact statement." 40 CFR 1502.14, *quoted in* Alaska Wilderness, 67 F.3d at 729, 730.

In addition, the CEQ regulations specify that agencies shall require "that the alternatives considered by the decision makers are encompassed by the range of alternatives discussed in the relevant environmental documents." 40 CFR § 1505.1(e)(emphasis added). The phrase 'range of alternatives' "includes all reasonable alternatives, which must be rigorously explored and objectively evaluated." Forty Most Asked Questions Concerning CEQ's NEPA Regulations, 1A.

Accordingly, federal courts set high standards for an agency's consideration of alternatives in a NEPA document and define the range of alternatives that must be considered. The agency must "[r]igorously explore and objectively evaluate **all reasonable alternatives**" to a proposed action. 40 CFR § 1502.14(a) (emphasis added); *see also* City of Tenakee Springs v. Clough, 915 F.2d 1308, 1310 (9th Cir. 1990). The Ninth Circuit has strictly enforced this requirement in numerous cases:

> To be adequate, an environmental impact statement must consider every reasonable alternative. An EIS is rendered inadequate by the existence of a viable but unexamined alternative. . . . Thus, the range of alternatives considered must be sufficient to permit a reasoned choice.

Methow Valley Citizens Council v. Regional Forester, 833 F.2d 810, 815 (9th Cir. 1987) (citations omitted), *rev'd on other grounds sub nom.* Robertson v. Methow Valley Citizens Council, 490 U.S. 332 (1989).

In this case, apart from the argument presented above regarding the BLM's inability to make a "reasoned choice" due to its mischaracterization of the No Action alternative, the BLM violated NEPA by failing to "rigorously explore and objectively evaluate all reasonable alternatives" to the proposed action. *See* City of Tenakee Springs v. Clough, 915 F.2d 1308, 1310 (9th Cir. 1990) (quoting 40 CFR § 1502.14).

1. Failure to Consider an Alternative that Remediates and Reclaims Contamination of Surface and Groundwater

In this case, as detailed above, the BLM illegally mischaracterized the No Action alternative as one that would allow groundwater and surface waters to remain contaminated in violation of FLPMA. However, to the extent that the BLM's characterization of the No Action alternative is upheld as accurate, the agency failed to consider a reasonable alternative that would have required the cleaning up of the contaminated groundwater and surface waters, even should

the Phoenix Project not be approved or Newmont not complete the Project as authorized in the ROD. Instead, the agency relied on its flawed analysis (including the No Action alternative analysis) that found that the Proposed Action would result in better water quality and geochemistry protections. However, the BLM provides no basis for neglecting to consider an alternative that would have required the reclamation of the ongoing and past contamination of the groundwater and surface waters.

2. Other Alternatives the BLM Failed to Consider or Inappropriately Rejected

The BLM failed to adequately analyze other reasonable alternatives as well, such as an alternative which would reduce seepage from the waste rock. The discussions in the FEIS at section 2.4.2.3 Waste Rock Facility Cap Design Alternatives and section 2.5.2.4 Waste Rock Facility Drainage Management Alternatives are based on a faulty and erroneous report. The section references Brown and Caldwell, 1999k, as the basis for the assumptions. The reference is incorrect; it should be dated 1999b. It is a technical memorandum to Walt Brown, U.S. Bureau of Land Management, Battle Mountain District, from Chuck Zimmerman, Brown and Caldwell, subject Phoenix Project Waste Rock Facility Design Criteria, dated December 17, 1999.

BLM rejected six alternatives: continuous capillary break and/or clay tailings layer, ten-foot nominal cap thickness, basal layer alternative, finger drain alternative, ground water cut-off system, and compacted soil alternative. FEIS at 2-52, 53. All were rejected based on the technical memorandum cited above. Appellants agree that the 10-foot cap alternative would not likely decrease seepage because once seepage reaches the five foot level in the cap, it will continue to the bottom of the cap. Appellants also agree that the drainage management alternatives are impractical because much of the waste rock will be added to existing waste rock,

the drain pipes could clog and would create an additional long-term maintenance issue, and cut-off trenches would be difficult.

BLM rejected the continuous capillary break alternative "because of the impracticality associated with placing and maintaining a uniformly-sized gravel layer between waste rock and the 5-foot cap." FEIS at 2-52. However, there was no reference for this statement. The implication is that it is not possible to place a gravel layer on top of the waste rock. There is no explanation of why this is more difficult or impractical than placing such a layer under a tailings impoundment, as is common in the mining industry. Brown and Caldwell, page 7, express concerns that fine material "may migrate from the overlying cap into the capillary break." Brown and Caldwell provide no reference for this speculation. Also, concerns include "roots penetrating below the base of the 5-foot cap." Id. Presumably this comes from Brown and Caldwell as well who mention that "alfalfa" roots could penetrate the cap. Alfalfa is not part of a standard reclamation seeding mix. The fact that the BLM frequently accepts 2 foot thick and thinner caps over closed cyanide heaps at other mining operations in Nevada without concern that the roots will reach the heap material is not discussed. *See, e.g.,* Final and Permanent Closure Plan for Leach Pad #1, Bald Mountain Mine (NV), at 3-1 to 3-2 (attached). Such a failure to justify the rejection of otherwise reasonable alternatives is arbitrary and capricious and cannot stand.

Brown and Caldwell show in Figure 3 that the seepage through a capillary barrier would be just 0.008 in/yr while that through the proposed 5-foot cover is 0.2 in/yr[1]. That is a 96% reduction over the proposed five foot cap. The technical memorandum incorrectly interprets its own Figure 3. "As shown in Figure 3, an **approximate ten percent decrease** in flux rates from

[1] Figure 3 in Brown and Caldwell is difficult to read and the actual values are not provided in the document.

the nominal five-foot cap proposed for Phoenix-Project facilities (between 0.2 and 2 inches per year) may be achieved by caps constructed with capillary or clay barriers." Brown and Caldwell at 6, 7, emphasis added. As shown above, the capillary barrier, based on information provided in the technical memorandum, reduces flux by 96%.

The summary dismissal of this alternative given the calculated benefit (96% reduction of seepage) does not meet the requirements of a hard look required by NEPA.

Brown and Caldwell showed three other alternatives that would reduce flux by 96%. These are capillary barrier (fines/compaction), capillary barrier and tailings (fines/compaction) and clay barrier (fines/compaction). The BLM's write-up in the FEIS does not mention these alternatives[2].

Overall, the failure to analyze reasonable alternatives and the failure to provide reasoned explanations for rejecting other reasonable alternatives does not comply with NEPA or the APA. As such, the Phoenix ROD and Plan Approval should be remanded to BLM in order for the agency to conduct the required alternatives analysis.

II. THE BLM VIOLATED THE FEDERAL LAND POLICY AND MANAGEMENT ACT (FLPMA)

1. Failure to Prevent Groundwater Contamination

The ROD and FEIS also fail to prevent groundwater contamination from Newmont's facilities. As BLM knows, failure to meet all water quality protection requirements is considered "unnecessary or undue degradation" under FLPMA and BLM's 3809 regulations. As such, and as noted herein, BLM should have required more environmentally protective measures to prevent

[2] The subsection where BLM rejected the capillary break is titled "Continuous Capillary Break and/or Clay Tailings Layers", but there is no discussion about the Clay Tailings Layers.

the contamination of groundwater. It should be noted that Newmont's and BLM's chosen method to remediate groundwater pollution will likely be ineffective.

For example, the capture/pump/treat system relied upon by Newmont is based on 100% capture of **all** groundwater for as long as is required. Outside of a brief discussion in Newmont's paid consultant's report, there has been no independent analysis as to whether this incredibly optimistic prediction will be realized. As EPA noted in its November 25, 2002 letter to the State Director:

> EPA is concerned that the high degree of uncertainty in the costs that BMG projects for extraction and treatment of the expected contaminated groundwater has not been addressed in the Final EIS. The groundwater flow modeling conducted by Baker Consultants assumed that the bedrock is a heterogeneous "porous medium," yet the bedrock in the project area is highly fractured and faulted. This simplified approach was used because of the lack of data at this stage of project planning. This approach introduces significant uncertainty and does not provide a conservative assessment. Faults and fractures in the bedrock create both barriers and conduits for groundwater flow and make it very difficult to predict velocity, direction, and pattern of a contaminant plume. Simulating ground water flow through fractured media is difficult, necessarily involves gross simplifications, and is inherently less accurate than modeling of porous media. Experts in the field do not agree on the applicability or accuracy of such simulations.
>
> The modeling approach used, although reasonable at this stage of planning, would not be acceptable for a final design document. The uncertainties related to the modeling must include contingencies, such as those suggested by EPA in this attachment, for estimating the long-term costs of mitigation.
>
> The uncertainties include:
>
> 1. The fractures and faults in the project area generally trend parallel to the predicted groundwater flow. The extraction wells may not capture the contaminant plumes if they travel past on a parallel track. The precise locations of wells to assure the capture of all contaminated groundwater in the fractured bedrock system is expected to be difficult to determine. Additional wells may be required in order to capture the contaminated flows. (The first set of extraction wells is proposed to be four wells. A 50 percent contingency would be enough for two more wells. This is not an unreasonable contingency and could be low).
>
> 2. The contaminant could reach the groundwater much sooner than 60 years if the fractures and faults act as conduits for flow.

> 3. The amount of water and contaminants reaching the wells could be greater, or could be more contaminated than predicted, increasing the costs of pumping, treating, and disposing of the water and treatment sludge. (For example, if the plant treats contaminated groundwater with higher concentrations than predicted, the *Contingent Long-Term Ground Water Management Plan* indicates that BMG would switch from sodium hydroxide neutralization to lime neutralization. This could double the cost of treatment).

EPA letter (detailed comments Attachment 1, at p. 3). We believe these very reasonable measures urged by EPA should be required by BLM.

In addition, a leading federal government analysis regarding the lack of a reasonable certainty in 100% capture of contaminated groundwater highlights the errors with adopting Newmont's assumption that 100% of the groundwater will be captured.

> **Many factors can inhibit ground-water restoration.** These factors may be grouped under three general categories:
>
> * Hydrogeologic factors;
> * Contaminant-related factors; and
> * Remediation system design inadequacies.
>
> **Hydrogeologic limitations to aquifer remediation include conditions such as complex sedimentary deposits; aquifers of very low permeability; certain types of fractured bedrock, and other conditions that presently make extraction** or *in situ* treatment **of contaminated ground water extremely difficult**.

Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration, at pp. 1-2, Directive 9234.2-25, September 1993, Office of Solid Waste and Emergency Response, U.S. EPA (emphasis added)(attached).

Here, BLM has not shown that "extremely difficult" groundwater capture can be done by Newmont with 100% confidence. This is especially true due to the hydrogeologic conditions under the polluting facilities at the Phoenix site. FEIS at 3.1-1 to 3.1-19. In other words, Newmont's assumption of a heterogeneous "porous medium," upon which its 100% groundwater capture scheme is based, is not true, as the local bedrock is fractured and the sedimentary deposits are complex. Overall, BLM must provide its own independent analysis so as to verify

that there is no reasonable chance that even a fraction of the contaminated groundwater will escape the capture system. Since such a bold claim cannot be supported, BLM cannot base its approval on the assumption of 100% capture.

2. FLPMA Requires Full-Cost Financial Assurances

The adequacy of financial assurances (FAs) has been recognized by the Interior Department as one of the most important aspects of its mining regulatory system and its duty to protect public lands and waters under FLPMA.

> At present, the potential taxpayer liability for reclamation of operations conducted under the 3809 regulations and not having a financial guarantee is in the millions of dollars. BLM has decided that to protect and restore the environment and to limit taxpayer liability, financial guarantees for reclamation should be required at 100 percent of the estimated cost for BLM to have the reclamation work performed.

66 Fed. Reg. 54834, 54847 (Oct. 30, 2001)(preamble to revised 3809 regulations). Thus, it is critical that the FAs (including long-term fund mechanisms) for Phoenix fully "protect and restore the environment and … limit taxpayer liability." That has not been done here.

BLM's mining regulations, which implement FLPMA's mandate to "prevent unnecessary or undue degradation," 43 U.S.C. § 1732(b), require, that, in approving a plan of operations, BLM independently analyze and require "full-cost" Financial Assurances (FA's).

> **§ 3809.552 What must my individual financial guarantee cover?**
> (a) If you conduct operations under a notice or a plan of operations and you provide an individual financial guarantee, it must cover the estimated cost as if BLM were to contract with a third party to reclaim your operations according to the reclamation plan, including construction and maintenance costs for any treatment facilities necessary to meet Federal and State environmental standards. The financial guarantee must also cover any interim stabilization and infrastructure maintenance costs needed to maintain the area of operations in compliance with applicable environmental requirements while third-party contracts are developed and executed.

43 CFR § 3809.552(a).

This same section of the BLM's mining regulations further detail the agency's (and the mine operator's) obligations regarding establishment of trust funds, such as the one BLM has required for the Phoenix Project:

> (c) When BLM identifies a need for it, [the operator] must establish a trust fund or other funding mechanism available to BLM to ensure the continuation of long-term treatment to achieve water quality standards and for other long term, postmining maintenance requirements. The funding must be adequate to provide for construction, long-term operation, maintenance, or replacement of any treatment facilities and infrastructure, for as long as the treatment and facilities are needed after mine closure. BLM may identify the need for a trust fund or other funding mechanism during plan review or later.

43 CFR § 3809.552(c).

BLM's duty to require adequate final assurances in order to meet its FLPMA mandate to "prevent unnecessary or undue degradation" (UUD) was also recently affirmed by the federal courts. In ruling on the adequacy of the BLM's 43 CFR Part 3809 regulations, the Federal District Court for the District of Columbia incorporated the Interior Department's arguments in that case. Mineral Policy Center v. Norton, 292 F.Supp.2d 30 (D.D.C. 2003). As recognized by the Court in that case:

> Specifically, Interior argues that it will protect the public lands from any UUD by exercising case-by-case discretion to protect the environment through the process of: …(3) requiring financial guarantees for costs of mining activities;

Id. at 44. The Court also clearly confirmed that the UUD standard under FLPMA "by its plain terms, vests the Secretary of the Interior with the authority – and indeed the obligation – to disapprove of an otherwise permissible mining operation because the operation, though necessary for mining, would unduly harm or degrade the public land." Id. at 42.

Here, BLM has not met its obligation to prevent UUD because it has not required full and adequate financial guarantees for the Phoenix Project.

3. The Financial Assurance/Bond and Trust Fund Are Inadequate and Violate FLPMA and the 3809 Regulations

a. Failure to Establish a Financial Assurance

BLM fails to establish the required financial assurance (FA) amount. This is true for the remediation of the current facilities and their pollution, as well as the additional facilities. As noted above, BLM cannot approve a mine plan of operations without establishing the financial assurance. The Phoenix ROD does not establish this FA, either for the first Phase of the Phoenix expansion, or even for the current facilities that are not part of the "Phoenix Project."

Such a failure violates BLM's own position in Nevada. In the current federal court lawsuit over BLM's approval of Newmont's SOAPA and Leeville projects, BLM has taken the position, that as long as it establishes the FA for the first phase of an approved plan of operations, it does not have to review or establish the FA for the overall project. Even if that position is affirmed by the federal court, the BLM at Phoenix has failed to establish what the FA is for the first phase of Phoenix. Such inconsistent decisionmaking is practically the definition of an arbitrary and capricious action and should be rejected by the State Director. The fact that the public has essentially been denied (and will be shut out in the future) an opportunity to review and challenge the final FA amount (even for the first phase) violates FLPMA and NEPA's public participation requirements.

b. Failure to Account for Current Remediation/Reclamation Costs

One of the most glaring errors of the Financial Assurance and Long-Term Contingency Fund ("LTCF") are their failure to account for the costs to remediate the current surface and ground water pollution. As detailed in the attached Report by Kuipers and Associates ("Financial Assurance Estimate for the Phoenix Project Contingent Long-Term Groundwater

Management Plan")(attached), the failure to account for these current costs violates BLM's duties under FLPMA and the 3809 regulations. This was also raised by EPA in its November 25, 2002 letter to BLM.

More specifically, BLM has the obligation to ensure that all water quality requirements are met at all times. Currently, according to BLM, this is being done by the water capture and treatment systems for the tailings chloride plume and the waste rock dumps. The costs to continue these systems must be covered by the FA or LTCF. However, neither the FA (if it existed in final form) nor the LTCF includes these costs.

As BLM knows, the FA or LTCF must cover all costs as if the operator was unable to perform these measures at any time. Under current operations, as well as when the new operations approved in the ROD begin, these costs are a liability against the site, and against BLM. Thus, the fact that some of these current pollution sources are proposed to be covered by new facilities does not mean that these costs do not currently exist or will not exist in the near future (i.e., even under Newmont's approved plan, these sources will remain for many years until eventually covered up by the new facilities).

Newmont may try to argue that the LTCF will cover these current and near-term future costs. However, this ignores what even BLM and Newmont agree is the fundamental aspect of the LTCF – monies put aside now need significant time to increase in value before they approach the higher amounts needed for remediation. Thus, any monies in the LCTF cannot cover the significant costs that would be needed **now** for continued remediation of the current pollution sources. Again, since any FA or LTCF must be based on the assumption that the FA or LTCF can be "called" at any time, the fact that there are no monies to cover the current costs fatally flaws BLM's decisionmaking.

In addition, Newmont cannot credibly argue that since the current facilities are covered by BLM's existing approvals, the current pollution and costs are not relevant to BLM's approval of the new facilities. This is especially true since, as soon as the "new" project disturbs lands/facilities covered by the existing approvals, these lands/facilities become part of the "new" Phoenix Project. Accordingly, such lands/facilities must be fully covered by the FA and/or the LTCF at all times.

c. Unrealistic Financial Assumptions

As detailed in the Kuipers Report, the LTCF is based on unrealistic assumptions regarding the economic parameters to be applied to the LTCF. For example, the LTCF is based on a 6.5% rate of return for the fund based on 1.5% inflation and an 8% interest rate. However, averaged inflation rates have ranged from 3% to 5% over the past 25 to 100 years. Further, interest rates for government securities have ranged from roughly 6% to 7% over the past 10 to 25 years. This suggests a rate of return of from 1% to 4% -- not the highly optimistic 6.5% assumed by BLM.

BLM cannot justify its adoption of these Newmont numbers under any rationale economic analysis. The BLM should revise the LTCF using defensible assumptions supported by realistic economic data.

d. Failure to Account for All Indirect Costs

As detailed in the Kuipers Report, the LTCF does not properly account for all indirect costs. These include necessary contingency, redesign, mobilization/demobilization, contractor overhead and profit, agency contract administration, and agency indirect costs (federal acquisition regulations). The LTCF (and the "main" FA as well, based on preliminary numbers

obtained by the Petitioners) does not even follow BLM's own FA policies regarding the required indirect costs. Newmont's LTCF indirect cost percentage increases were only 18%. BLM adopted this without challenging any of Newmont's assumptions.

Based on the practices of the various federal and state agencies, the following percentages should be used for the Phoenix Project LTCF calculation:

- Contingency 25% (high level of uncertainty)
- Engineering Redesign 6%
- Mobilization/Demobilization 5%
- Contractor Overhead and Profit 15%
- Agency Contract Administration 10%
- Agency Indirect Costs 17.8% (of contract administration costs based on FAR guidance).

BLM directives from both the Nevada State Office and National Headquarters require at least 45% in indirect costs. *See* BLM Nevada IM-NV-2002-066; BLM IM-2003-082. The above recommended indirect costs equal approximately 63% of direct costs. The B&C estimate included 18% indirect costs for contingency and engineering. Table 8 in the Kuipers Report compares the results for the different LTCF amounts based on total indirect cost multipliers of 18% for the B&C Preliminary Cost Estimate and 63% for the revised cost estimate with present versus future costs and increased capital and operating costs. The B&C LTCF estimate increases from $408,000 to $482,675 based on increased indirect costs and the revised LTCF estimate totals $34,700,000 (not including the additional monies needed to account for a realistic rate of return, *see* Kuipers Report, Table at p. 2).

e. Summary of LTCF Issues

The Kuipers Report also details these and a number of other errors in the LTCF that must be corrected. Overall, as shown in the Kuipers Report, the proper LTCF should be, at a minimum, approximately $60 million.

	Total Cost	**Present Value**
BLM Estimate	$72,300,000	$408,000
Revised Estimate for Existing Conditions	$70,800,000	$12,100,000
Revised Estimate for Existing Conditions and Increased Direct Costs	$167,000,000	$28,900,000
Revised Estimate for Existing Conditions and Increased Direct Costs and Increased Indirect Costs	$189,000,000	$34,700,000
Revised Estimate for Existing Conditions and Increased Direct Costs and Increased Indirect Costs and Decreased Rate of Return	$189,000,000	*$60,000,000*

Kuipers Report at 2.

For brevities sake, this Appeal incorporates and adopts the attached Kuipers Report. Each issue in the Kuipers Report must be reviewed by the State Director. The State Director must independently evaluate each issue raised by this Appeal, as well as the Kuipers Report, and independently respond to each issue. Petitioners/Appellants also incorporate and adopt, to the extent not inconsistent with this Petition/Appeal, all of the issues and concerns raised by the EPA in EPA's November 25, 2002 letter to the State Director. Each of these issues must also be independently reviewed and responded to by the State Director.

CONCLUSION

As shown herein, the BLM's ROD and accompanying FEIS and financial assurance mechanisms (e.g., FA and LTCF) do not comply with FLPMA, NEPA and BLM regulations and policy. As such, the State Director should vacate and remand the ROD, FEIS and these other

determinations with instructions to the Battle Mountain Field Office to correct all problems. In the meantime, the State Director should stay implementation of the ROD during his review of this Petition/Appeal, and also during the remand period.

Respectfully submitted this 19th day of March, 2004

_____

Roger Flynn
Jeffrey C. Parsons
Nicole U. Rinke

Attorneys for Great Basin Mine Watch, Western Shoshone Defense Project, and Mineral Policy Center/Earthworks

EXHIBIT D

Financial Assurance Estimate For the Phoenix Project Contingent Long-Term Groundwater Management Plan

March 15, 2004

Prepared for:
Great Basin Mine Watch, Reno, NV

Prepared by:
Kuipers and Associates, Butte, MT

TABLE OF CONTENTS

LIST OF TABLES

1. SUMMARY OF RESULTS

Based on our analysis the Long Term Contingency Fund estimate used by Bureau of Land Management (BLM) is highly flawed and grossly inadequate to protect against public liability for existing and future mine reclamation and closure costs at the proposed Phoenix Project. This conclusion is consistent with that of the Environmental Protection Agency as contained in their comments on the Final Environmental Impact Statement provided to the BLM. This conclusion is also consistent when the BLM's estimate is compared against that of other federal and state estimates, including others where BLM has been involved, for addressing long-term water quality protection at hardrock mine sites.

The BLM estimated a trust fund amount of $408,000. Our analysis indicates that the actual amount of the trust fund should be approximately $60 million (as compared to $33.5 million estimated by EPA) based upon the following:

- The estimate does not address existing groundwater and surface water contamination at the mine site which requires monitoring and mitigation regardless of future operations. Costs for remediation of the existing contamination on site should be included in determining the trust fund amount.

- The available information is inadequate to determine accurate present and future capital and operating requirements, and therefore large uncertainties with respect to reclamation and closure activities and costs exist leading EPA to recommend, consistent with costs at other typical mine sites, three times the originally estimated costs.

- The estimate relied upon by BLM only includes 18% for indirect costs while agency recommendations range from 25 – 90% for indirect costs with 63% recommended for this project.

- The estimate relies on a 6.5% rate of return for the fund based on 1.5% inflation and an 8% interest rate while averaged inflation rates ranged from 3% to 5% over the past 25 to 100 years - interest rates of government securities ranged from approximately 6-7% over the past 10 to 25 years - suggesting a rate of return of from 1–4% has historically occurred and therefore a rate of 3% is recommended as realistic and conservative for the purpose of calculating the trust fund.

- Other issues with the trust fund also exist with respect to the conceptual and general nature of the preliminary cost estimate, lack of cost escalation to current dollars in the estimate, and critical information regarding the administration and management of the trust fund has not been provided by BLM.

These changes result in an increased estimated trust fund as follows:

	Total Cost	Present Value
BLM Estimate	$72,300,000	$408,000
Revised Estimate for Existing Conditions	$70,800,000	$12,100,000
Revised Estimate for Existing Conditions and Increased Direct Costs	$167,000,000	$28,900,000
Revised Estimate for Existing Conditions and Increased Direct Costs and Increased Indirect Costs	$189,000,000	$34,700,000
Revised Estimate for Existing Conditions and Increased Direct Costs and Increased Indirect Costs and Decreased Rate of Return	$189,000,000	$60,000,000

2. INTRODUCTION AND BACKGROUND

This financial assurance estimate was prepared to determine the correct amount of funding which should be required to ensure that if the operator of the Phoenix Project were to go bankrupt or otherwise be unable or unwilling to perform reclamation and closure at the mine site, the responsible regulatory agencies would have the funds needed to perform the necessary activities in order to protect human health and the environment. The cost estimate contained in this document is based on and consistent with financial assurance estimates that have been performed by federal and state agencies and standard engineering cost estimation methods. It differs from a typical mine operators cost estimate in that it is based on financial assurance requirements and estimates the costs for the responsible federal and state government agencies to perform reclamation and closure and otherwise assume responsibility for the site.

The U.S. Department of Interior Bureau of Land Management (BLM) has issued a Record of Decision (ROD) for the Phoenix Project. Due to the potential for groundwater quality impacts from waste rock facilities, a Contingent Long-Term Groundwater Management Plan (Brown and Caldwell, August 2000) (CLTGWMP) has been developed for monitoring and mitigation. In addition a Preliminary Cost Estimate for the Phoenix Project Contingent Long-Term Groundwater Plan (Brown and Caldwell, 2001) (Preliminary Cost Estimate) to fund a proposed Long-Term Contingency Fund (LTCF) was performed and accepted by the BLM for the purposes of providing financial assurance for long-term water quality related impacts.

The ROD approves the mining plan of operation for Battle Mountain Gold Company's (BMG) Phoenix Project near Battle Mountain, Nevada. BMG is a wholly owned subsidiary of Newmont Mining Corporation. The proposal would significantly expand BMG's current mining and mineral processing operations at the site, over a 28-year period, including development of two new open pits, expansion of two existing pits, processing of previously mined stockpiled gold ore, expansion and construction of heap leach, milling, waste rock, and tailings facilities, and backfilling of three existing open pits. The proposed project would disturb 6,497 acres (greater than 10 square miles) of public and private lands. Of this, approximately 4,295 acres would be new disturbance (2,382 acres of public lands and 1,913 acres of private lands).

In order to prevent post-closure off-site migration of the contaminated groundwater, BLM's proposed mitigation includes implementation of the CLTGWMP and establishment of the LTCF to ensure that funding is available in perpetuity. The requirement to include funding for long-term water resource protection is part of BLM's newly revised *Surface Mining Regulations for Surface Mineral Operations at 43 CFR 3809 ("3809 Regulations").* Specifically, the regulations require operators to:

> Establish a trust fund or other funding mechanism available to BLM to ensure the continuation of long-term treatment to achieve water quality standards and for other long term, post-mining maintenance requirements. The funding must be adequate to provide for construction, long-term operation, maintenance, or replacement of any treatment facilities and infrastructure, for as long as the treatment and facilities are needed after mine closure. BLM may identify the need for a trust fund or other funding mechanism during plan review or later. [43 CFR 3809.552(c)]

The purpose of this new provision is clearly to protect the public from liability for mine reclamation and closure, and BLM has determined the need for such a fund to be established for the Phoenix Project.

3. EXISTING CONDITION

The existing condition of the water resources in the vicinity of the mine is described in the FEIS. The project area includes mining facilities from more than a century of copper and precious metals mining. This includes seven open pits that have not been backfilled, a tailings facility which an existing contaminant plume, heap leach areas and waste rock dumps, extending over a surface area of approximately 3,000 acres. Groundwater and surface water in the area currently exceed drinking water standards for numerous contaminants, including pH, total dissolved solids, and metals. The majority of waste rock at the site is acid-generating; and acidic water moving through the waste rock and tailings from the existing facilities will mobilize metals and sulfates, leaching them into groundwater beneath the site after mine closure.

The Phoenix Project FEIS establishes that the existing water quality has been significantly affected by past mining activities in the project area, and groundwater currently exceeds maximum contaminant levels (MCLs) for numerous parameters including arsenic, beryllium, cadmium, chloride, copper, iron, lead, manganese, mercury, nickel, selenium, zinc, total dissolved solids and low pH (p. 3.2-27-3.2-34). It demonstrates surface water exceedances for most of the contaminants listed of drinking water standards in surface waters (streams, springs and seeps) on or just downstream of the existing mine site. (p. 3.2-14-3.2-18). The combination of low pH and high dissolved metal and sulfate concentrations reported for surface waters, found near historic mining facilities and mineralized areas, indicates that acid rock drainage exists (p. 3.2-18).

Specific monitoring and mitigation actions that are presently required at the site include:

- Pumping at three existing extraction wells at a combined rate of approximately 2,000 gpm for an estimated 10 years to mitigate the chloride plume near the tailings disposal area (FEIS p. viii).

- The Fortitude Pit Lake is expected to have a surface area of 38 acres and depth of 285 feet and water quality is predicted to exceed secondary drinking water standards and concentrations could increase due to evaporative concentration (FEIS p. viii).

- If water ponds in the Minnie Pit, it would likely be acidic with some elevated metals concentrations (FEIS p. ix).
- The geochemical studies have determined that the vast majority of the waste rock material is potentially acid generating resulting in degradation of groundwater quality beneath and downgradient of these facilities and that currently there is no plan in place to mitigate the predicted long-term infiltration from waste rock facilities (FEIS p. ix).

- Collection and treatment of acidic surface water from Iron Canyon and Butte Canyon until final closure and mitigation measures have been implemented (FEIS p. 3.2-18)

The extents to which these activities would be necessary in the event the proposed Phoenix Project would not proceed, or only partially proceed, has not been explicitly addressed in the FEIS, in the CLTWQMP, or in the LTCF. At present, no federal or state process has fully identified and determined the necessary mitigations for the existing site, and no financial assurance has been estimated or required to address the monitoring and mitigation of existing water resources impacts. Were the site to be abandoned tomorrow, because no existing plan or funds exist for cleanup of the existing site, it would likely involve a significantly difficult and expensive cleanup effort, potentially totaling in the hundreds of millions of dollars.

4. PROJECT PROPONENT'S COST ESTIMATE

BMG contracted with Brown and Caldwell (B&C) to develop the CLTGWMP and provide the Preliminary Cost Estimate to determine the LCTF amount. B&C estimated a total present value (2004 dollars) for the fund of $408,300 to create a self-sustaining fund for long-term groundwater management as defined in the CLTGWMP. The estimate was based on the following assumptions.

- Monitoring costs are zero during the mining and reclamation period covering years 0 to 32.
- Post-reclamation monitoring of waste rock facilities and groundwater starts in year 33.
- Mitigation costs are zero until year 60 at which time the first potential effect to groundwater is predicted outside the mining area (at a compliance point).
- Costs are carried out for 180 years (costs beyond 180 years having no significant effect on present value).
- A 6.5% discount rate was used to estimate the present value of the LTCF based on an 8% interest rate and 1.5% inflation rate

Table 1 shows the schedule and total estimated annual costs from the Preliminary Cost Estimate. On a total cost basis the estimate shows that over the 179 year project life estimated monitoring costs of $11,800,000 and mitigation costs of $60,500,000 for a total cost of $72,300,000 would be incurred. However, based on a 6.5% discount rate for the trust fund and the delay in the onset of monitoring and mitigation costs contained in the CLTGWMP the Preliminary Cost Estimate determined a present value of $408,000 for the LTCF. The large cost difference between the total cost and present value is due to the assumption that costs will occur in the future as projected and the trust fund will grow in order to pay out the costs as they are incurred. Therefore, the ability of the LTCF to provide the required financial assurance is based largely on the costs being incurred as projected and the intervening trust fund rate of return and inflation rate.

5. REVISED COST ESTIMATE

Review of the CLTGWMP and Preliminary Cost Estimate for the LTCF reveal that many of the assumptions used in the work are inconsistent with the requirements of financial assurance cost estimates. The two primary inconsistencies between the estimates provided by the mine operator BMG and relied upon by the BLM are: 1) relying on future conditions rather than existing conditions to perform the estimate and; 2) not accounting for agency indirect costs in the estimate. In addition, other inconsistencies have been noted and are described together with the primary inconsistencies in the following sections.

5.1. Present Versus Future Conditions

In estimating financial assurance requirements the question should not be asked "what will the mine cost to reclaim and close when mining is done?", but rather "what will the mine cost to reclaim at any time between the present conditions and when mining is done?" For that reason it makes sense to look at an estimate for financial assurance as if the company were to go bankrupt at any time between when the mine is started and at any time during planned mined operations, in addition to an estimate for the cost at the completion of mining.

According to the ROD (p. 5), the CLTGWMP and therefore the LTCF "addresses the monitoring of new project facilities (underline added)." The B&C estimate for the LTCF was not performed specifically as an estimate of financial assurance requirements, but rather as an amount the company might incur at the completion of mining due primarily to new mining at the site. In the event the project proceeds as scheduled, with all assumptions being correct, it represents the amount that will be needed in 33 years if Newmont were assumed to do the reclamation and closure activities (calculated in 2004 dollars). The B&C cost estimate is for the company's cost upon completion of all planned mining 33 years in the future– not the agencies cost to remediate existing and future pollution that could be incurred between now and the completion of mining in 33 years in the event of bankruptcy or other factors applicable to financial assurance.

As noted by EPA (2001, comments p. 4), "…the cost of closing the mine in year 10 may actually be higher than closing the mine at year 30… To assure that funds are available to close the mine at all times, it is therefore not appropriate to only evaluate the cost of closure in 30 years. The DEIS should therefore evaluate the cost of closing the mine at various intervals (such as every 5 years) over the life of the project using realistically conservative assumptions and assuming that a third party government contractor is performing the closure and post-closure activities."

As most federal and state agencies review and revise financial assurance every three to five years it is typical to phase the financial assurance in as it is required. In the case of an existing mine the financial assurance is recalculated every three to five years to address existing surface reclamation and water resource protection requirements and costs as well as future (i.e. created in the next five years) costs. In the case of the

Phoenix Project it is possible that the existing cost of mine reclamation and closure could equal or exceed future costs. For that reason it is critical that the financial assurance amount presently held by the responsible agency or agencies (BLM in this case) be adequate to reclaim and close (or continue to operate over the long-term) the site today and within the next five years rather than some possible scenario 33 years in the future.

The affect this has on the financial assurance amount is significant. Using the assumption that existing groundwater and surface water pumping and water treatment can be enhanced to address existing contamination at approximately the same capital and operating costs and schedule as that of the plan for post-Phoenix reclamation and closure is a fair approximation of the scenario. Table 2 shows the ensuing change in cost that occurs. The costs shown in the table are the same as in the B&C estimate except it is assumed that capital expenditures for monitoring and additional groundwater pumping and water treatment occur in year one and are carried out for a period of 120 years for the purposes of the estimate. Under this scenario, the LCTF amount is increased from $408,000 estimated by B&C to $12,100,000.

This scenario is given added credence by the probability of acid drainage contamination related to new mining as proposed for the Phoenix Project requiring mitigation earlier than has been predicted by the model used in developing the CLTGWMP. As pointed out by the EPA (2002, comments p. 3), the prediction has uncertainties that include the potential for contamination to require mitigation much sooner than the 60 years predicted. By including existing operations and costs for additional mitigation in the LTCF estimate it can be better assured that future conditions will be adequately funded. The BLM proposal to monitor and adjust technical and economic data, as pointed out by EPA (2002, comments p. 19), "will not remedy the problems identified here."

5.2. Increased Capital and Operating Costs

According to the EPA (2002, comments p. 3), additional wells may be required to capture the contaminated flows from the Phoenix Project and assumedly the same holds true for contaminated flows from the existing mining related disturbances. In addition, EPA (2002, comments p. 3) states "The amount of water and contaminants reaching the wells could be greater, or could be more contaminated than predicted, increasing the costs of pumping, treating, and disposing of the water and treatment sludge." The EPA's (2002, comments p. 4) review of the B&C LTCF estimate found that "the future treatment and monitoring programs could cost more than 3 times BLM's estimate to construct and operate." In the EPA's (2002, comments p. 6) view "BLM's proposed perpetual treatment program has taken the most optimistic approach in each instance, and anticipates that installation of the minimum number of extraction wells and treatment of the minimum flow of contaminated groundwater are all that will be required."

EPA (2002, comments p. 4) estimated the capital cost for groundwater pumping at $2.4 million, water treatment at $6.7 million, and annual operations and maintenance costs at $750,000 per year. Because no comprehensive evaluation of the existing site has been performed, as well as the high degree of uncertainty in future projections, the actual

requirements for groundwater pumping, water treatment, reinjection and sludge disposal as well as monitoring are difficult to project. The best estimate is to use information from comparable sites. Table 3 lists capital and operating costs for seven mine sites where published information is available and post-mining water treatment required. The data suggests a range of capital costs of from $600,000 to $22,387,000 and annual operating costs of from $347,000 to $1.8 million. Based on this information the EPA estimates appear to be reasonable and would provide a conservative basis for financial assurance.

Table 4 shows the additional costs in terms of the LTCF present value if the original B&C estimate were revised as recommended by EPA. The estimated total cost over the projected period would be $168,000,000. The present value for the LTCF would increase from $408,000 estimated by B&C to $818,000 as a result of increased costs for water management and treatment activities.

Table 5 shows the additional costs in terms of the LTCF present value if the estimate revised in the prior section for present versus future conditions were also revised for increased capital and operating costs as recommended by EPA. The estimated total cost over the projected period would be $167,000,000. The present value for the LTCF would increase from $408,000 to $28,900,000 as a result of assuming present rather than future conditions and increased costs for water management and treatment activities.

5.3. Agency Conducted Closure Costs and Administration

5.3.1. Agency Indirect Costs

Financial assurance calculations must include indirect costs for agency conducted reclamation and closure. Indirect costs include contingency, engineering redesign, mobilization/demobilization, contractor overhead and profit, agency contract administration, and agency indirect costs.

Contingency covers costs that may result from incomplete design, unforeseen and unpredictable conditions, or uncertainties within the defined project scope. The amount of the contingency will depend on the status of design, procurement, and construction; and the complexity and uncertainties of the component parts of the project.

Engineering designs of sufficient detail for mine cleanup are not developed until the latter stages of a projects operations life, typically in the final one to two years before the permanent cessation of operations. Most mines do prepare less detailed cleanup plans that are periodically updated during the mine life. However, most mine bankruptcies or other circumstances occur where mine cleanup to at least some extent has not been completed or in many cases implemented or designed. In many cases, the existing designs have proven to be adequate. Therefore, engineering design and redesign costs can be significant.

Mobilization and Demobilization costs will be incurred by the engineering, construction and operations contractors. It includes costs for moving of equipment and machinery, personnel, mobile vehicles, and consumable materials and supplies to and from the mine site. It also includes the establishment of field offices, shop buildings, warehouses, sanitary facilities, utilities and other facilities need to proceed with the project work. Costs vary significantly based on the type and amount of equipment and machinery, personnel, vehicles and consumables involved, distance to the site, and other factors.

Contractor overhead and profit includes costs that will be incurred by the contractor include construction management, construction coordination, quality engineering, health and safety, and head office/administration. A construction manager is responsible for construction activities with responsibilities that include subcontracting, purchasing, scheduling, and actual construction (particularly on smaller projects). Construction coordination includes field engineering and coordination of field construction. Quality engineering is a function of the size and type of project. It can include costs for field testing and personnel (such as concrete or compaction testing).

Agency contract administration covers those activities performed by state or federal agency staff on the specific project, beginning from the time cleanup begins, until the completion of all necessary tasks or indefinite continuation of some tasks. This includes planning, organizing, directing, controlling and reporting on the status of the project and include the following:

- technical management and liaison with the designers, engineers, management, and contractors.
- coordination and control during design and construction;
- maintenance and operation of scheduling, estimating, and project control systems during design and construction;
- technical management and coordination of the construction manager and his support staff;
- overall management and coordination of the activities of non-dedicated project support personnel;
- technical management of review and approval activities conducted by dedicated management personnel;
- coordination of all aspects of the project;
- preparation, revision, and related activities in support reports;
- project financial management;
- project personnel management;
- project law enforcement; and
- project public relations.

Agency indirect costs were introduced in the BLM's recent guidance. The indirect cost rate of 17.8% is based on Federal Acquisition Regulations (FAR) which require that the indirect cost rate be assessed on all cost recoverable, reimbursable, trust, and road

maintenance projects for FY 2003.[1] The application of this rate is most likely applicable as an additional multiplier of agency contract administration costs and could be argued as being included in that cost category by other agencies.

A multiplier from guidelines is typically used by the various federal and state agencies in calculating indirect costs for financial assurance purposes. Table 6 shows the various guidelines for indirect costs in mine cleanup financial assurance estimation published by the BLM, EPA, Forest Service and OSM. Table 7 compares the percentage range of indirect costs for each category and agency and overall. It should be noted that not all the cost categories are included by each agency and that there is a large cost multiplier range for each indirect cost category.

EPA (2002, comment p. 4) noted that "BLM did not include all appropriate markups for third party construction of the necessary capital improvements and performance of monitoring and O&M as specified in BLM's applicable guidance (*Nevada BLM Bonding Process for Plans of Operations Authorized by 43 CFR 3802/3809*, September 2000)." It should also be noted that the BLM "guidance" does not restrict the agency from considering its duty to protect public liability and require additional or greater amounts for indirect costs.

Based on the practices of the various federal and state agencies we recommend the following percentages be used for the Phoenix Project LTCF calculation

- Contingency 25% (high level of uncertainty)
- Engineering Redesign 6%
- Mobilization/Demobilization 5%
- Contractor Overhead and Profit 15%
- Agency Contract Administration 10%
- Agency Indirect Costs 17.8% (of contract administration costs based on FAR guidance).

BLM guidance suggests at least 45% in indirect costs. The above recommended indirect costs equal approximately 63% of direct costs. The B&C estimate included 18% indirect costs for contingency and engineering. Table 8 compares the results for the different LTCF amounts based on total indirect cost multipliers of 18% for the B&C Preliminary Cost Estimate and 63% for the revised cost estimate with present versus future costs and increased capital and operating costs. The B&C LTCF estimate increases from $408,000 to $482,675 based on increased indirect costs and the revised LTCF estimate totals $34,700,000.

[1] FAR WO IM 2003-011, October 8, 2002.

Table 8
Comparison of Original and Revised Values for Different Indirect Cost Multipliers

	B&C Estimate	Revised B&C Estimate	Revised Estimate with Present and Increased Costs
Indirect Cost Multiplier	18%	63%	63%
Total Cost	$72,254,000	$81,302,017	$189,060,173
LCTF PV	$408,000	$482,675	$34,658,723

5.3.2. Present Value Calculation

The foundation of any financial assurance instrument used to fund long-term reclamation and closure liabilities is the real investment return on the trust fund. In its comments EPA (2002, comments p. 6) stated that the rate of return used in the LTCF "is overly optimistic" citing the assumptions used in the estimate that the project operator will always be available to pay taxes and management fees on the trust fund, no margin of safety in the economic analysis, to low an inflation rate was used, and the trust fund return rate was too high.

Inflation is used to predict the future cost of a project in current dollars by determining a net present value. By assuming some interest rate on funds accrued or placed in a trust fund and factoring in inflation it is theoretically possible to predict and therefore fund a 100 year obligation for water treatment over that period of time.

Assuming inflation will continue at a rate in the future equal to that of historical escalation over the previous twenty five year period, the cost of inflation estimated from the Consumer Cost Index (CCI) for 1978-2003 would be 5.6% per year. This compares to the CCI over the period of the last 100 years which would be approximately 3%.

Discount rates are used to predict future rates of interest on financial assurance funds that might be deposited and expected to bear interest such as for trust funds. Interest rates are difficult to predict and even the best sources have been known to fail. From a federal policy perspective, the U.S. Treasury Yields, as depicted in Table 9, are suggested as the basis for interest on trust funds if they were to be held as government backed securities. As indicated, the average yield has ranged from approximately 6.2% to 7.4% for five and ten year instruments over the past period of from 10 to 25 years.

The B&C estimate uses a 6.5% rate of return on the LTCF based on an interest rate of 1.5% and a discount rate of 8%. Historic interest rates averaged over the past 25-100 years have ranged from 3 – 5.6%. Historic discount rates over the past 10-25 year period have ranged from 6 – 7%. Even if the highest discount rate of 7% were combined with the lowest inflation rate of 3% the rate of return on the LTCF would only be estimated at

4%. For that reason the 6.5% rate of return in the B&C estimate cannot be justified and a conservative 3% rate of return is recommended.

Based on a 3% discount rate the B&C LTCF estimate increases significantly to $4,900,000. The estimated LTCF based on present versus future conditions and increased capital and operating costs in addition to increased indirect costs would total approximately $60 million.

Table 9

U.S. Treasury Yields

Year	Ten Year	Five Year	Year	Ten Year	Five Year
1962	3.95	3.70	1962	3.95	3.70
1963	4.00	3.83	1963	4.00	3.83
1964	4.19	4.07	1964	4.19	4.07
1965	4.28	4.25	1965	4.28	4.25
1966	4.93	5.11	1966	4.93	5.11
1967	5.07	5.10	1967	5.07	5.10
1968	5.64	5.70	1968	5.64	5.70
1969	6.67	6.93	1969	6.67	6.93
1970	7.35	7.38	1970	7.35	7.38
1971	6.16	5.99	1971	6.16	5.99
1972	6.21	5.98	1972	6.21	5.98
1973	6.85	6.87	1973	6.85	6.87
1974	7.56	7.82	1974	7.56	7.82
1975	7.99	7.78	1975	7.99	7.78
1976	7.61	7.18	1976	7.61	7.18
1977	7.42	6.99	1977	7.42	6.99
1978	8.41	8.32	1978	8.41	8.32
1979	9.43	9.51	1979	9.43	9.51
1980	11.43	11.45			
1981	13.92	14.25			
1982	13.01	13.01			
1983	11.1	10.79			
1984	12.46	12.26			
1985	10.62	10.12			
1986	7.67	7.30			
1987	8.39	7.94			
1988	8.85	8.48			
1989	8.49	8.50			
1990	8.55	8.37	1990	8.55	8.37
1991	7.86	7.37	1991	7.86	7.37
1992	7.01	6.19	1992	7.01	6.19
1993	5.87	5.14	1993	5.87	5.14
1994	7.09	6.69	1994	7.09	6.69
1995	6.57	6.38	1995	6.57	6.38
1996	6.44	6.18	1996	6.44	6.18
1997	6.35	6.22	1997	6.35	6.22
1998	5.26	5.15	1998	5.26	5.15
1999	5.65	5.55	1999	5.65	5.55
2000	6.03	6.16	2000	6.03	6.16
2001	5.02	4.56	2001	5.02	4.56
High	13.92	14.25	High	9.43	9.51
Low	3.95	3.70	Low	3.95	3.70
Average	7.43	7.26	Average	6.38	6.22

6. OTHER LTCF ISSUES

The B&C Preliminary Cost Estimate was conducted in 2001 and costs should be escalated to reflect the costs in current 2004 dollars. Escalation is the provision in a cost estimate for increases in the cost of equipment, material, labor, etc., due to continuing price changes over time. Escalation is used to bring historical costs to the present. Most cost estimating is done in "current" dollars. Escalation is based on actual historical measured increases in the cost of goods and services overall or for a specific industry sector. Historical escalation data is generally readily available and easily evaluated.

The B&C estimate is "preliminary" and is highly conceptual, general and simplified. According to EPA (2002, comments p. 17), "The level of detail provided by BLM to date does not allow EPA to conclude the financial assurances will be satisfactory." As pointed out in this estimate the level of uncertainty is large but clearly points to significantly higher costs than have been estimated for the LTCF.

Critical information regarding the administration and management of the LTCF has not been provided by BLM. This has been recognized by EPA (2002, comments p. 17) which listed the following inadequacies in this regard:

(a) requirements for timing of payments into the trust fund;
(b) how BLM ensures that the trust fund is bankruptcy remote;
(c) acceptable financial instruments (such as those specified in 43 CFR 3809.555);
(d) legal structure of the trust for tax purposes;
(e) who will pay the taxes on trust earnings and trust fees and expenses;
(f) how taxes and trust fees will be paid on the trust if the mining company goes out of business;
(g) who will make investment decisions if the operator is no longer viable;
(h) if the federal government controls the investment decisions, what legal and ethical issues arise from BLM controlling investment decisions about investments in private companies, voting stock and similar issues if the trust owns stock;
(i) the identity of the trust fund beneficiaries; and
(j) the identity and corporate structure of the operator with responsibility/ liability for financial assurance at this site.

BLM has suggested that the proposed monitoring program during project operations will provide sufficient data upon which to base adjustment of the LTCF, and that if future changes are needed BLM can require BMG to provide additional funds. BLM will also require BMG to post a $1 million surety for 30 years to ensure that money is available to fully fund the trust should BMG fail to provide additional funding. Under this scenario, the maximum amount of funding obtainable by the BLM from existing financial assurance (the LTCF + $1M) would be $1.4 million.

The EPA estimated the LTCF at $33.5 million and our estimate for the LTCF is approximately $60 million. According to the EPA, "it will be very difficult for BLM to require BMG to make additional payments into the Long-Term Trust Fund due to, among

other things, the significant increase in funds required and the amount of time that will pass until information sufficient to trigger such an increase becomes available" potentially making the project "environmentally unacceptable" and "infeasible."

7. REFERENCES

Brown and Caldwell, 2000, *Phoenix Project Contingent Long-Term Groundwater Management Plan*, prepared for Battle Mountain Gold, August 2000.

Brown and Caldwell, 2001, *Preliminary Cost Estimate for the Phoenix Project Contingent Long-Term Groundwater Management Plan*, prepared for Battle Mountain Gold, July 2001.

U.S Environmental Protection Agency, 2001, Letter to Gerald Smith, BLM from Lori Yoshii, Acting Regional Administrator, EPA dated May 4, 2001 with attached *EPA Comments on the Phoenix Mine Draft EIS.*

U.S Environmental Protection Agency, 2002, Letter to Robert Abbey, State Director, BLM from Wayne Nastri, Regional Administrator, EPA dated November 25, 2002 with attached *EPA Detailed Comments on the Phoenix Mine Final SEIS.*

U.S. Department of Interior, Bureau of Land Management, *Phoenix Project Final Environmental Impact Statement*, January 2002.

U.S. Department of Interior, Bureau of Land Management, *Phoenix Project Record of Decision and Plan of Operations Approval*,, November 2003.

Tables 1-7

Table 6
Federal Agency Guidelines
Indirect Costs

Agency	BLM	EPA RI/FS	FS	OSM
Source	Instruction Memorandum No. 2003-042, Financial Guarantee Cost Estimates for Notices and Plans of Operations, February 5, 2003	A Guide to Developing and Documenting Cost Estimates During the Feasibility Study, July 2000	Reclamation Bond Estimating and Administration Guide for Mineral Plans of Operation authorized and administered under 36 CFR 228A, March 2003	Handbook for Calculation of Reclamation Bond Amounts, Revised April 2000
Contingency	A contingency cost is included in the reclamation cost estimation to cover unforeseen cost elements in the estimating procedure. Calculate the contingency cost as a percentage of the operational project costs as follows: up to and including $500,000, use 10%; over $500,000 to $5 million, use 8%; over $5 million to $50 million, use 6%; and greater than $50 million, use 4%.	Scope contingency typically ranges from 10 to 25 percent. Higher values may be justified for alternatives with greater levels of cost growth potential. Bid contingency typically ranges from 10 to 20 percent. The total contingency value (bid + scope) that is applied to annual O&M costs is typically equal to or greater than the contingency applied to capital costs.	4-30% based on accuracy, time required for estimate, percentage completion of engineering and percentage of capital expenditure (Gentry and Hrebar, 1978)	Based on the *1998 Means Heavy Construction Cost Data,* this allowance should range between 3 and 5 percent of the total direct costs.
Engineering Redesign		The percentage of total capital cost for remedial design can be estimated using Exhibit 5-8 (6-20%).	Engineering redesign costs typically range between 2% and 10% of the total direct costs. *Cost Estimating Guide for Road Construction, Regions 2,3,4, USDA-Forest Service; Office of Surface Mining, Handbook for the Calculation of Reclamation Bond Amounts*	Based on the *1998 Means Building Cost Data*, the allowance for these engineering fees (landscape and site development) should range between 3.5% and 6% of the total direct costs.
Mobilization/ Demobilization			The standard allowances for this category normally ranges up to 10 percent of the total direct costs. *Cost Estimating Guide for Road Construction, Regions 2,3,4, USDA-Forest Service; Office of Surface Mining, Handbook for the Calculation of Reclamation Bond Amounts*	Mobilization and demobilization costs normally range up to 10 percent of the total direct costs. Unusual time constraints, a need for special equipment, the presence of non-standard features or conditions that hinder equipment mobility, or a remote location may require actual cost estimates that could result in the use of a higher percentage.

Table 6
Federal Agency Guidelines
Indirect Costs

Agency	BLM	EPA RI/FS	FS	OSM
Contractor Overhead and Profit[1]	Overhead: Insurance premiums are calculated at 1.5% of the total labor costs. Enter the premium amount only on this line if insurance items listed in #1 above are not included in the itemized unit costs. Federal construction contracts exceeding $100,000 require both a performance and a payment bond (Miller Act, 40 USC 270et seq.). Each bond premium is figured at 1.5% of the total operational project costs. Enter the sum of both premium costs on this line. Profit: For Federal construction contracts, use 10% of estimated operational project costs.	The percentage of total capital cost for construction management can be estimated using Exhibit 5-8 (6-15%).	Profit and overhead allowances are usually estimated based on a percentage of the total direct costs, typically ranging between 15%-30% (R.S. Means).	To simplify the process, Graph 1, Profit and Overhead, combines profit and overhead into a single cost allowance, calculated as a percentage of the total inflated direct costs (15-30%). This graph is based on the *1998 Means Building Construction Cost Data.*
Agency Contract Administration	For Federal construction contracts, use 18% of operational project costs for estimates up to and including $1 million. Use 14% of estimated project costs over $1 million to $25 million and 10% of estimated project costs over $25 million.	For capital costs, project management can be estimated using Exhibit 5-8 (5-10%). For O&M costs, project management generally ranges from 5 to 10 percent of total annual O&M cost.	Includes Agency Administration and Contract Administration, referencing Graph (RS Means) showing Contract Administration at 2-7% of direct costs.	Use Graph 2, Project Management Fee, to calculate this fee (2-7%). This graph reflects the construction cost data in *1998 Means Building Construction Cost Data.*
Agency Indirect Costs	BLM's indirect costs (building rental, electricity, telephone, etc.). The indirect cost rate to be assessed on all cost recoverable, reimbursable, trust, and road maintenance projects for FY 2003 is 17.8 percent (see WO IM 2003-011, October 8, 2002).			

1 Contractor Overhead includes site liability insurance, performance and payment bond

Table 7
Federal Agency Guidelines
Indirect Cost Percentage Comparison

Agency	BLM	EPA RI/FS	FS	OSM
Contingency	4-10%	20-45%	4-30%	3-5%
Engineering Redesign		6-20%	2-10%	3.5-6%
Mobilization/Demobilization			1-10%	1-10%
Contractor Overhead and Profit (1)	14%	6-15%	15-30%	15-30%
Agency Contract Administration	10-18%	5-10%	2-7%	2-7%
Agency Indirect Costs	17.80%			
Total	46-70%	37-90%	24-87%	25-58%

1 Contractor Overhead includes site liability insurance, performance and payment bond

Table 1
Brown and Caldwell Groundwater Management Long-Term Trust Fund
Phoenix Project, Nevada

Kuipers and Associates
15-Mar-04

Year		Monitoring Costs							Mitigation Costs										Total Costs
		Capital Costs		Operating Costs			Indirect Costs	Total Monitoring Costs	Capital Costs			Operating Costs					Indirect Costs	Total Mitigation Costs	
No	Calendar	WRF Mntrng	GW Mntrng	Admin	WRF Mmtrmg	GW Mntrng	Eng & cntngncy		Water Treatment	GW Pumping	Ancillary	Admin	Water Treatment	GW Pumping	Ancillary	Sludge Mgmnt	Eng & cntngncy		
1	2004							$0										$0	$0
2	2005							$0										$0	$0
3	2006							$0										$0	$0
4	2007							$0										$0	$0
5	2008							$0										$0	$0
6	2009							$0										$0	$0
7	2010							$0										$0	$0
8	2011							$0										$0	$0
9	2012							$0										$0	$0
10	2013							$0										$0	$0
11	2014							$0										$0	$0
12	2015							$0										$0	$0
13	2016							$0										$0	$0
14	2017							$0										$0	$0
15	2018							$0										$0	$0
16	2019							$0										$0	$0
17	2020							$0										$0	$0
18	2021							$0										$0	$0
19	2022							$0										$0	$0
20	2023							$0										$0	$0
21	2024							$0										$0	$0
22	2025							$0										$0	$0
23	2026							$0										$0	$0
24	2027							$0										$0	$0
25	2028							$0										$0	$0
26	2029							$0										$0	$0
27	2030							$0										$0	$0
28	2031							$0										$0	$0
29	2032							$0										$0	$0
30	2033							$0										$0	$0
31	2034							$0										$0	$0
32	2035							$0										$0	$0
33	2036	$202,091		$8,000	$24,521		$36,376	$270,988							$2,127		$0	$2,127	$273,115
34	2037			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
35	2038			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
36	2039			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
37	2040			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
38	2041			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
39	2042			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
40	2043			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
41	2044			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
42	2045			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
43	2046			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
44	2047			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
45	2048			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
46	2049			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
47	2050			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
48	2051			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
49	2052			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
50	2053		$659,628	$8,000	$24,521	$27,319	$118,733	$838,201							$2,127		$0	$2,127	$840,328
51	2054			$8,000	$24,521	$27,319	$0	$59,840							$2,127		$0	$2,127	$61,967
52	2055			$8,000	$24,521	$27,319	$0	$59,840							$2,127		$0	$2,127	$61,967
53	2056			$8,000	$24,521	$27,319	$0	$59,840							$2,127		$0	$2,127	$61,967
54	2057			$8,000	$24,521	$27,319	$0	$59,840							$2,127		$0	$2,127	$61,967

Table 1
Brown and Caldwell Groundwater Management Long-Term Trust Fund
Phoenix Project, Nevada

Kuipers and Associates
15-Mar-04

Year		Monitoring Costs							Mitigation Costs										Total Costs
		Capital Costs		Operating Costs			Indirect Costs	Total Monitoring Costs	Capital Costs			Operating Costs					Indirect Costs	Total Mitigation Costs	
No	Calendar	WRF Mntrng	GW Mntrng	Admin	WRF Mntrng	GW Mntrng	Eng & cntngncy		Water Treatment	GW Pumping	Ancillary	Admin	Water Treatment	GW Pumping	Ancillary	Sludge Mgmnt	Eng & cntngncy		
55	2058			$8,000	$24,521	$27,319	$0	$59,840							$2,127		$0	$2,127	$61,967
56	2059			$8,000	$24,521	$27,319	$0	$59,840							$2,127		$0	$2,127	$61,967
57	2060	$202,091		$8,000	$24,521	$27,319	$36,376	$298,307							$2,127		$0	$2,127	$300,434
58	2061			$8,000	$24,521	$27,319	$0	$59,840							$2,127		$0	$2,127	$61,967
59	2062			$8,000	$24,521	$27,319	$0	$59,840							$2,127		$0	$2,127	$61,967
60	2063				$24,521	$27,319	$0	$51,840	$2,060,000	$796,337	$596,526	$31,000	$235,490	$24,692	$21,195	$15,315	$621,515	$4,402,070	$4,453,910
61	2064				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
62	2065				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
63	2066				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
64	2067				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
65	2068				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$235,490	$44,692	$21,195	$15,315	$6,984	$393,478	$445,318
66	2069				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
67	2070				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
68	2071				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
69	2072				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
70	2073				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$235,490	$124,692	$21,195	$15,315	$6,984	$473,478	$525,318
71	2074				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
72	2075				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
73	2076				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
74	2077				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
75	2078				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$235,490	$44,692	$21,195	$15,315	$6,984	$393,478	$445,318
76	2079				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
77	2080				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
78	2081				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
79	2082				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
80	2083		$277,788		$24,521	$27,319	$50,002	$379,630	$2,090,000	$38,802		$31,000	$243,066	$124,692	$21,195	$17,965	$383,184	$2,949,904	$3,329,534
81	2084				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
82	2085	$202,091			$24,521	$27,319	$36,376	$290,307				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$628,225
83	2086				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
84	2087				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
85	2088				$24,521	$27,319	$0	$51,840		$64,736		$31,000	$243,066	$44,692	$21,195	$17,965	$11,652	$434,306	$486,146
86	2089				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
87	2090				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
88	2091				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
89	2092				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
90	2093				$24,521	$27,319	$0	$51,840		$38,802	$213,000	$31,000	$243,066	$124,692	$21,195	$17,965	$45,324	$735,044	$786,884
91	2094				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
92	2095				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
93	2096				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
94	2097				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
95	2098				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$243,066	$44,692	$21,195	$17,965	$6,984	$403,704	$455,544
96	2099				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
97	2100				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
98	2101				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
99	2102				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
100	2103		$659,628		$24,521	$27,319	$118,733	$830,201	$2,090,000	$38,802		$31,000	$244,015	$124,692	$21,195	$18,316	$383,184	$2,951,204	$3,781,405
101	2104				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
102	2105				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
103	2106				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
104	2107				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
105	2108				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$244,015	$44,692	$21,195	$18,316	$6,984	$405,004	$456,844
106	2109				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
107	2110	$202,091			$24,521	$27,319	$36,376	$290,307				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$629,525
108	2111				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058

Table 1
Brown and Caldwell Groundwater Management Long-Term Trust Fund
Phoenix Project, Nevada

Kuipers and Associates
15-Mar-04

Year		Monitoring Costs							Mitigation Costs										Total Costs
		Capital Costs		Operating Costs			Indirect Costs	Total Monitoring Costs	Capital Costs			Operating Costs					Indirect Costs	Total Mitigation Costs	
No	Calendar	WRF Mntrng	GW Mntrng	Admin	WRF Mntrng	GW Mntrng	Eng & cntngncy		Water Treatment	GW Pumping	Ancillary	Admin	Water Treatment	GW Pumping	Ancillary	Sludge Mgmnt	Eng & cntngncy		
109	2112				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
110	2113				$24,521	$27,319	$0	$51,840		$64,736	$28,467	$31,000	$244,015	$124,692	$21,195	$18,316	$16,777	$549,198	$601,038
111	2114				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
112	2115				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
113	2116				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
114	2117				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
115	2118				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$244,015	$44,692	$21,195	$18,316	$6,984	$405,004	$456,844
116	2119				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
117	2120				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
118	2121				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
119	2122				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
120	2123				$24,521	$27,319	$0	$51,840	$2,060,000	$38,802	$213,000	$31,000	$234,541	$124,692	$21,195	$14,964	$416,124	$3,154,318	$3,206,158
121	2124				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
122	2125				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
123	2126				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
124	2127				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
125	2128				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$234,541	$44,692	$21,195	$14,964	$6,984	$392,178	$444,018
126	2129				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
127	2130				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
128	2131				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
129	2132				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
130	2133		$277,788		$24,521	$27,319	$50,002	$379,630		$38,802		$31,000	$234,541	$124,692	$21,195	$14,964	$6,984	$472,178	$851,808
131	2134				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
132	2135	$202,091			$24,521	$27,319	$36,376	$290,307				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$616,699
133	2136				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
134	2137				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
135	2138				$24,521	$27,319	$0	$51,840		$796,337		$31,000	$234,541	$44,692	$21,195	$14,964	$143,341	$1,286,070	$1,337,910
136	2139				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
137	2140				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
138	2141				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
139	2142				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
140	2143				$24,521	$27,319	$0	$51,840	$2,060,000	$38,802		$31,000	$235,174	$124,692	$21,195	$15,192	$377,784	$2,903,839	$2,955,679
141	2144				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
142	2145				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
143	2146				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
144	2147				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
145	2148				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$235,174	$44,692	$21,195	$15,192	$6,984	$393,039	$444,879
146	2149				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
147	2150				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
148	2151				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
149	2152				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
150	2153		$659,628		$24,521	$27,319	$118,733	$830,201		$38,802	$213,000	$31,000	$235,174	$124,692	$21,195	$15,192	$45,324	$724,379	$1,554,580
151	2154				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
152	2155				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
153	2156				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
154	2157				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
155	2158				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$235,174	$44,692	$21,195	$15,192	$6,984	$393,039	$444,879
156	2159				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
157	2160	$202,091			$24,521	$27,319	$36,376	$290,307				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$617,560
158	2161				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
159	2162				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
160	2163				$24,521	$27,319	$0	$51,840	$2,070,000	$64,736	$140,900	$31,000	$236,855	$124,692	$21,195	$15,771	$409,614	$3,114,763	$3,166,603
161	2164				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
162	2165				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353

Table 1
Brown and Caldwell Groundwater Management Long-Term Trust Fund
Phoenix Project, Nevada

Kuipers and Associates
15-Mar-04

Year		Monitoring Costs							Mitigation Costs										Total Costs
		Capital Costs		Operating Costs			Indirect Costs	Total Monitoring Costs	Capital Costs			Operating Costs					Indirect Costs	Total Mitigation Costs	
No	Calendar	WRF Mntrng	GW Mntrng	Admin	WRF Mmtrmg	GW Mntrng	Eng & cntngncy		Water Treatment	GW Pumping	Ancillary	Admin	Water Treatment	GW Pumping	Ancillary	Sludge Mgmnt	Eng & cntngncy		
163	2166				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
164	2167				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
165	2168				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$236,855	$44,692	$21,195	$15,771	$6,984	$395,299	$447,139
166	2169				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
167	2170				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
168	2171				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
169	2172				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
170	2173				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$236,855	$124,692	$21,195	$15,771	$6,984	$475,299	$527,139
171	2174				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
172	2175				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
173	2176				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
174	2177				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
175	2178				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$236,855	$44,692	$21,195	$15,771	$6,984	$395,299	$447,139
176	2179				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
177	2180				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
178	2181				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
179	2182				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
Total		$1,212,546	$2,534,460	$216,000	$3,604,587	$3,551,470	$674,461	$11,793,524	$12,430,000	$2,524,120	$1,404,893	$3,720,000	$28,582,820	$4,303,040	$2,600,829	$1,950,460	$2,944,622	$60,460,784	$72,254,308
PV		$32,328	$31,448	$13,409	$50,280	$19,200	$11,480	$158,145	$65,960	$20,900	$14,533	$11,604	$88,902	$12,560	$11,499	$5,997	$18,251	$250,204	$408,349

Table 2
Revised Groundwater Management Long-Term Trust Fund Estimate
Phoenix Project, Nevada

Kuipers and Associates
15-Mar-04

Year		Monitoring Costs							Mitigation Costs										Total Costs
		Capital Costs		Operating Costs			Indirect Costs	Total Monitoring Costs	Capital Costs			Operating Costs					Indirect Costs	Total Mitigation Costs	
No	Calendar	WRF Mntrng	GW Mntrng	Admin	WRF Mntrng	GW Mntrng	Eng & cntngncy		Water Treatment	GW Pumping	Ancillary	Admin	Water Treatment	GW Pumping	Ancillary	Sludge Mgmnt	Eng & cntngncy		
1	2004	$202,091	$659,628		$24,521	$27,319	$155,109	$1,068,668	$2,060,000	$796,337	$596,526	$31,000	$235,490	$24,692	$21,195	$15,315	$621,515	$4,402,070	$5,470,739
2	2005				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
3	2006				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
4	2007				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
5	2008				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
6	2009				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$235,490	$44,692	$21,195	$15,315	$6,984	$393,478	$445,318
7	2010				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
8	2011				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
9	2012				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
10	2013				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
11	2014				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$235,490	$124,692	$21,195	$15,315	$6,984	$473,478	$525,318
12	2015				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
13	2016				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
14	2017				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
15	2018				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
16	2019				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$235,490	$44,692	$21,195	$15,315	$6,984	$393,478	$445,318
17	2020				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
18	2021				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
19	2022				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
20	2023				$24,521	$27,319	$0	$51,840				$31,000	$235,490	$24,692	$21,195	$15,315	$0	$327,692	$379,532
21	2024		$277,788		$24,521	$27,319	$50,002	$379,630	$2,090,000	$38,802		$31,000	$243,066	$124,692	$21,195	$17,965	$383,184	$2,949,904	$3,329,534
22	2025				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
23	2026	$202,091			$24,521	$27,319	$36,376	$290,307				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$628,225
24	2027				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
25	2028				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
26	2029				$24,521	$27,319	$0	$51,840		$64,736		$31,000	$243,066	$44,692	$21,195	$17,965	$11,652	$434,306	$486,146
27	2030				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
28	2031				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
29	2032				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
30	2033				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
31	2034				$24,521	$27,319	$0	$51,840		$38,802	$213,000	$31,000	$243,066	$124,692	$21,195	$17,965	$45,324	$735,044	$786,884
32	2035				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
33	2036				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
34	2037				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
35	2038				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
36	2039				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$243,066	$44,692	$21,195	$17,965	$6,984	$403,704	$455,544
37	2040				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
38	2041				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
39	2042				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
40	2043				$24,521	$27,319	$0	$51,840				$31,000	$243,066	$24,692	$21,195	$17,965	$0	$337,918	$389,758
41	2044		$659,628		$24,521	$27,319	$118,733	$830,201	$2,090,000	$38,802		$31,000	$244,015	$124,692	$21,195	$18,316	$383,184	$2,951,204	$3,781,405
42	2045				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
43	2046				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
44	2047				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
45	2048				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
46	2049				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$244,015	$44,692	$21,195	$18,316	$6,984	$405,004	$456,844
47	2050				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
48	2051	$202,091			$24,521	$27,319	$36,376	$290,307				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$629,525
49	2052				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
50	2053				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
51	2054				$24,521	$27,319	$0	$51,840		$64,736	$28,467	$31,000	$244,015	$124,692	$21,195	$18,316	$16,777	$549,198	$601,038
52	2055				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
53	2056				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
54	2057				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058

Table 2
Revised Groundwater Management Long-Term Trust Fund Estimate
Phoenix Project, Nevada

Kuipers and Associates
15-Mar-04

Year		Monitoring Costs							Mitigation Costs										Total Costs
		Capital Costs		Operating Costs			Indirect Costs	Total Monitoring Costs	Capital Costs			Operating Costs					Indirect Costs	Total Mitigation Costs	
No	Calendar	WRF Mntrng	GW Mntrng	Admin	WRF Mntrng	GW Mntrng	Eng & cntngncy		Water Treatment	GW Pumping	Ancillary	Admin	Water Treatment	GW Pumping	Ancillary	Sludge Mgmnt	Eng & cntngncy		
55	2058				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
56	2059				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$244,015	$44,692	$21,195	$18,316	$6,984	$405,004	$456,844
57	2060				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
58	2061				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
59	2062				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
60	2063				$24,521	$27,319	$0	$51,840				$31,000	$244,015	$24,692	$21,195	$18,316	$0	$339,218	$391,058
61	2064				$24,521	$27,319	$0	$51,840	$2,060,000	$38,802	$213,000	$31,000	$234,541	$124,692	$21,195	$14,964	$416,124	$3,154,318	$3,206,158
62	2065				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
63	2066				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
64	2067				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
65	2068				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
66	2069				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$234,541	$44,692	$21,195	$14,964	$6,984	$392,178	$444,018
67	2070				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
68	2071				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
69	2072				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
70	2073				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
71	2074		$277,788		$24,521	$27,319	$50,002	$379,630		$38,802		$31,000	$234,541	$124,692	$21,195	$14,964	$6,984	$472,178	$851,808
72	2075				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
73	2076	$202,091			$24,521	$27,319	$36,376	$290,307				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$616,699
74	2077				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
75	2078				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
76	2079				$24,521	$27,319	$0	$51,840		$796,337		$31,000	$234,541	$44,692	$21,195	$14,964	$143,341	$1,286,070	$1,337,910
77	2080				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
78	2081				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
79	2082				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
80	2083				$24,521	$27,319	$0	$51,840				$31,000	$234,541	$24,692	$21,195	$14,964	$0	$326,392	$378,232
81	2084				$24,521	$27,319	$0	$51,840	$2,060,000	$38,802		$31,000	$235,174	$124,692	$21,195	$15,192	$377,784	$2,903,839	$2,955,679
82	2085				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
83	2086				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
84	2087				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
85	2088				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
86	2089				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$235,174	$44,692	$21,195	$15,192	$6,984	$393,039	$444,879
87	2090				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
88	2091				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
89	2092				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
90	2093				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
91	2094		$659,628		$24,521	$27,319	$118,733	$830,201		$38,802	$213,000	$31,000	$235,174	$124,692	$21,195	$15,192	$45,324	$724,379	$1,554,580
92	2095				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
93	2096				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
94	2097				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
95	2098				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
96	2099				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$235,174	$44,692	$21,195	$15,192	$6,984	$393,039	$444,879
97	2100				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
98	2101	$202,091			$24,521	$27,319	$36,376	$290,307				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$617,560
99	2102				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
100	2103				$24,521	$27,319	$0	$51,840				$31,000	$235,174	$24,692	$21,195	$15,192	$0	$327,253	$379,093
101	2104				$24,521	$27,319	$0	$51,840	$2,070,000	$64,736	$140,900	$31,000	$236,855	$124,692	$21,195	$15,771	$409,614	$3,114,763	$3,166,603
102	2105				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
103	2106				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
104	2107				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
105	2108				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
106	2109				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$236,855	$44,692	$21,195	$15,771	$6,984	$395,299	$447,139
107	2110				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
108	2111				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353

Table 2
Revised Groundwater Management Long-Term Trust Fund Estimate
Phoenix Project, Nevada

Kuipers and Associates
15-Mar-04

Year		Monitoring Costs							Mitigation Costs										Total Costs
		Capital Costs		Operating Costs			Indirect Costs	Total Monitoring Costs	Capital Costs			Operating Costs					Indirect Costs	Total Mitigation Costs	
No	Calendar	WRF Mntrng	GW Mntrng	Admin	WRF Mmtrmg	GW Mntrng	Eng & cntngncy		Water Treatment	GW Pumping	Ancillary	Admin	Water Treatment	GW Pumping	Ancillary	Sludge Mgmnt	Eng & cntngncy		
109	2112				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
110	2113				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
111	2114				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$236,855	$124,692	$21,195	$15,771	$6,984	$475,299	$527,139
112	2115				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
113	2116				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
114	2117				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
115	2118				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
116	2119				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$236,855	$44,692	$21,195	$15,771	$6,984	$395,299	$447,139
117	2120				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
118	2121				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
119	2122				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
120	2123				$24,521	$27,319	$0	$51,840				$31,000	$236,855	$24,692	$21,195	$15,771	$0	$329,513	$381,353
Total		$1,010,455	$2,534,460	$0	$2,942,520	$3,278,280	$638,085	$10,403,800	$12,430,000	$2,524,120	$1,404,893	$3,720,000	$28,582,820	$4,303,040	$2,543,400	$1,950,460	$2,944,622	$60,403,355	$70,807,155
PV		$249,530	$748,594	$0	$377,049	$420,073	$179,662	$1,974,908	$2,709,601	$858,566	$597,009	$476,674	$3,652,052	$515,940	$325,907	$246,354	$749,732	$10,131,835	$12,106,743

Table 3
Acid Drainage Water Treatment Facilities - Capital and Operating Costs

			Capital Costs			Annual Operating Costs				Summary		
Facility	Treatment Method	Design Capacity (gpm)	Treatment Plant Construction	Other Treatment Related Facilities	Replace-ment costs	O&M Labor	O&M General Operations	Reagent Cost	Sludge Disposal	Subtotal Capital Costs	Subtotal Annual Operating Costs	Annual Cost / 1000 gallon treated**
[1]Argo Tunnel (Denver, CO)	Sodium hydroxide precipitation	700	$5,000,000			$410,000	$310,000	$269,000	$45/ton*	$5,000,000	$989,000	$2.69
[1]Eagle Mine (Eagle County, CO)	Calcium hydroxide precipitation	200	$600,000			$400,000	$80,000	$276,000	$15/cy*	$600,000	$756,000	$7.19
[1]Leadville Mine Drainage Tunnel (Leadville, CO)	CO_2 stripping, NaOH precipitation	2,000	$7,500,000			$182,000	$398,000	$220,000	$50/cy*	$7,500,000	$800,000	$0.76
[2]Golden Sunlight Mine (Whitehall, MT)	Calcium hydroxide precipitation	350	$475,000	$72,868	$828,524	$127,572	$260,864	$239,919		$1,376,392	$628,355	$3.42
[3]Tyrone Mine (Tyrone, NM)	Calcium hydroxide precipitation	1,500	$15,504,999	$4,217,386	$2,664,806	$303,040	$1,025,485	$458,035		$22,387,191	$1,786,560	$2.27
[4]Zortman and Landkusky Mines (Fort Bellknap, MT)	Calcium hydroxide precipitation, ferric sulfate and floc. precipitation	600	$2,503,250		$3,086,624	$363,299	$380,256	$111,364	$26,424	$5,589,874	$881,343	$2.79

*Cost included in O&M General Operations.

**Based on annual operating costs at design capacity treatment rate.

References:

[1]Willow M, tenBrack C. 1999. *Survey of three hard-rock acid draininage treatment facilities in Colorado.* Tailings and Mine Waste '99. pp 759-767. Based on actual costs.

[2]Hydrometrics, Inc. May 20, 1998. Estimated capital and operating costs for long-term water treatment at the Golden Sunlight Mine.

[3]NMDEQ. 2001. Future water treatment cost estimate prepared by Mark Phillip.

[4]Werner, Peter. 24 July 2000. Molycorp's Questa Mine Water Treatment Plan Cost Estimate. AND Bill Maehl per. Communication 21 Mar 2003. AND Zortman and Landusky MPDES permits November 2001

Table 4
Brown and Caldwell Groundwater Management Long-Term Trust Fund with Increased Costs
Phoenix Project, Nevada

Kuipers and Associates
15-Mar-04

Year		Monitoring Costs							Mitigation Costs										Total Costs
		Capital Costs		Operating Costs			Indirect Costs	Total Monitoring Costs	Capital Costs			Operating Costs					Indirect Costs	Total Mitigation Costs	
No	Calendar	WRF Mntrng	GW Mntrng	Admin	WRF Mmtrmg	GW Mntrng	Eng & cntngncy		Water Treatment	GW Pumping	Ancillary	Admin	Water Treatment	GW Pumping	Ancillary	Sludge Mgmnt	Eng & cntngncy		
1	2004							$0										$0	$0
2	2005							$0										$0	$0
3	2006							$0										$0	$0
4	2007							$0										$0	$0
5	2008							$0										$0	$0
6	2009							$0										$0	$0
7	2010							$0										$0	$0
8	2011							$0										$0	$0
9	2012							$0										$0	$0
10	2013							$0										$0	$0
11	2014							$0										$0	$0
12	2015							$0										$0	$0
13	2016							$0										$0	$0
14	2017							$0										$0	$0
15	2018							$0										$0	$0
16	2019							$0										$0	$0
17	2020							$0										$0	$0
18	2021							$0										$0	$0
19	2022							$0										$0	$0
20	2023							$0										$0	$0
21	2024							$0										$0	$0
22	2025							$0										$0	$0
23	2026							$0										$0	$0
24	2027							$0										$0	$0
25	2028							$0										$0	$0
26	2029							$0										$0	$0
27	2030							$0										$0	$0
28	2031							$0										$0	$0
29	2032							$0										$0	$0
30	2033							$0										$0	$0
31	2034							$0										$0	$0
32	2035							$0										$0	$0
33	2036	$202,091		$8,000	$24,521		$36,376	$270,988							$2,127		$0	$2,127	$273,115
34	2037			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
35	2038			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
36	2039			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
37	2040			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
38	2041			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
39	2042			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
40	2043			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
41	2044			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
42	2045			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
43	2046			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
44	2047			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
45	2048			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
46	2049			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
47	2050			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
48	2051			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
49	2052			$8,000	$24,521		$0	$32,521							$2,127		$0	$2,127	$34,648
50	2053		$659,628	$8,000	$24,521	$27,319	$118,733	$838,201							$2,127		$0	$2,127	$840,328
51	2054			$8,000	$24,521	$27,319	$0	$59,840							$2,127		$0	$2,127	$61,967
52	2055			$8,000	$24,521	$27,319	$0	$59,840							$2,127		$0	$2,127	$61,967
53	2056			$8,000	$24,521	$27,319	$0	$59,840							$2,127		$0	$2,127	$61,967
54	2057			$8,000	$24,521	$27,319	$0	$59,840							$2,127		$0	$2,127	$61,967

Table 4
Brown and Caldwell Groundwater Management Long-Term Trust Fund with Increased Costs
Phoenix Project, Nevada

Kuipers and Associates
15-Mar-04

Year		Monitoring Costs							Mitigation Costs										Total Costs
		Capital Costs		Operating Costs			Indirect Costs	Total Monitoring Costs	Capital Costs			Operating Costs					Indirect Costs	Total Mitigation Costs	
No	Calendar	WRF Mntrng	GW Mntrng	Admin	WRF Mntrng	GW Mntrng	Eng & cntngncy		Water Treatment	GW Pumping	Ancillary	Admin	Water Treatment	GW Pumping	Ancillary	Sludge Mgmnt	Eng & cntngncy		
55	2058			$8,000	$24,521	$27,319	$0	$59,840							$2,127		$0	$2,127	$61,967
56	2059			$8,000	$24,521	$27,319	$0	$59,840							$2,127		$0	$2,127	$61,967
57	2060	$202,091		$8,000	$24,521	$27,319	$36,376	$298,307							$2,127		$0	$2,127	$300,434
58	2061			$8,000	$24,521	$27,319	$0	$59,840							$2,127		$0	$2,127	$61,967
59	2062			$8,000	$24,521	$27,319	$0	$59,840							$2,127		$0	$2,127	$61,967
60	2063				$24,521	$27,319	$0	$51,840	$6,700,000	$2,400,000	$596,526	$31,000	$750,000	$24,692	$21,195	$15,315	$1,745,375	$12,284,103	$12,335,943
61	2064				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
62	2065				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
63	2066				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
64	2067				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
65	2068				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$15,315	$6,984	$907,988	$959,828
66	2069				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
67	2070				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
68	2071				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
69	2072				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
70	2073				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$124,692	$21,195	$15,315	$6,984	$987,988	$1,039,828
71	2074				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
72	2075				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
73	2076				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
74	2077				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
75	2078				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$15,315	$6,984	$907,988	$959,828
76	2079				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
77	2080				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
78	2081				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
79	2082				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
80	2083		$277,788		$24,521	$27,319	$50,002	$379,630	$6,700,000	$38,802		$31,000	$750,000	$124,692	$21,195	$17,965	$1,212,984	$8,896,638	$9,276,268
81	2084				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
82	2085	$202,091			$24,521	$27,319	$36,376	$290,307				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$1,135,159
83	2086				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
84	2087				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
85	2088				$24,521	$27,319	$0	$51,840		$64,736		$31,000	$750,000	$44,692	$21,195	$17,965	$11,652	$941,240	$993,080
86	2089				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
87	2090				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
88	2091				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
89	2092				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
90	2093				$24,521	$27,319	$0	$51,840		$38,802	$213,000	$31,000	$750,000	$124,692	$21,195	$17,965	$45,324	$1,241,978	$1,293,818
91	2094				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
92	2095				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
93	2096				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
94	2097				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
95	2098				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$17,965	$6,984	$910,638	$962,478
96	2099				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
97	2100				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
98	2101				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
99	2102				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
100	2103		$659,628		$24,521	$27,319	$118,733	$830,201	$6,700,000	$38,802		$31,000	$750,000	$124,692	$21,195	$18,316	$1,212,984	$8,896,989	$9,727,190
101	2104				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
102	2105				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
103	2106				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
104	2107				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
105	2108				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$18,316	$6,984	$910,989	$962,829
106	2109				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
107	2110	$202,091			$24,521	$27,319	$36,376	$290,307				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$1,135,510
108	2111				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043

Table 4
Brown and Caldwell Groundwater Management Long-Term Trust Fund with Increased Costs
Phoenix Project, Nevada

Kuipers and Associates
15-Mar-04

Year		Monitoring Costs							Mitigation Costs										Total Costs
		Capital Costs		Operating Costs			Indirect Costs	Total Monitoring Costs	Capital Costs			Operating Costs					Indirect Costs	Total Mitigation Costs	
No	Calendar	WRF Mntrng	GW Mntrng	Admin	WRF Mntrng	GW Mntrng	Eng & cntngncy		Water Treatment	GW Pumping	Ancillary	Admin	Water Treatment	GW Pumping	Ancillary	Sludge Mgmnt	Eng & cntngncy		
109	2112				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
110	2113				$24,521	$27,319	$0	$51,840		$64,736	$28,467	$31,000	$750,000	$124,692	$21,195	$18,316	$16,777	$1,055,183	$1,107,023
111	2114				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
112	2115				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
113	2116				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
114	2117				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
115	2118				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$18,316	$6,984	$910,989	$962,829
116	2119				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
117	2120				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
118	2121				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
119	2122				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
120	2123				$24,521	$27,319	$0	$51,840	$6,700,000	$38,802	$213,000	$31,000	$750,000	$124,692	$21,195	$14,964	$1,251,324	$9,144,977	$9,196,817
121	2124				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
122	2125				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
123	2126				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
124	2127				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
125	2128				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$14,964	$6,984	$907,637	$959,477
126	2129				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
127	2130				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
128	2131				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
129	2132				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
130	2133		$277,788		$24,521	$27,319	$50,002	$379,630		$38,802		$31,000	$750,000	$124,692	$21,195	$14,964	$6,984	$987,637	$1,367,267
131	2134				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
132	2135	$202,091			$24,521	$27,319	$36,376	$290,307				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$1,132,158
133	2136				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
134	2137				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
135	2138				$24,521	$27,319	$0	$51,840		$796,337		$31,000	$750,000	$44,692	$21,195	$14,964	$143,341	$1,801,529	$1,853,369
136	2139				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
137	2140				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
138	2141				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
139	2142				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
140	2143				$24,521	$27,319	$0	$51,840	$6,700,000	$38,802		$31,000	$750,000	$124,692	$21,195	$15,192	$1,212,984	$8,893,865	$8,945,705
141	2144				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
142	2145				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
143	2146				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
144	2147				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
145	2148				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$15,192	$6,984	$907,865	$959,705
146	2149				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
147	2150				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
148	2151				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
149	2152				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
150	2153		$659,628		$24,521	$27,319	$118,733	$830,201		$38,802	$213,000	$31,000	$750,000	$124,692	$21,195	$15,192	$45,324	$1,239,205	$2,069,406
151	2154				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
152	2155				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
153	2156				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
154	2157				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
155	2158				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$15,192	$6,984	$907,865	$959,705
156	2159				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
157	2160	$202,091			$24,521	$27,319	$36,376	$290,307				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$1,132,386
158	2161				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
159	2162				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
160	2163				$24,521	$27,319	$0	$51,840	$6,700,000	$64,736	$140,900	$31,000	$750,000	$124,692	$21,195	$15,771	$1,243,014	$9,091,308	$9,143,148
161	2164				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
162	2165				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498

Table 4
Brown and Caldwell Groundwater Management Long-Term Trust Fund with Increased Costs
Phoenix Project, Nevada

Kuipers and Associates
15-Mar-04

Year		Monitoring Costs							Mitigation Costs										Total Costs
		Capital Costs		Operating Costs			Indirect Costs	Total Monitoring Costs	Capital Costs			Operating Costs					Indirect Costs	Total Mitigation Costs	
No	Calendar	WRF Mntrng	GW Mntrng	Admin	WRF Mmtrmg	GW Mntrng	Eng & cntngncy		Water Treatment	GW Pumping	Ancillary	Admin	Water Treatment	GW Pumping	Ancillary	Sludge Mgmnt	Eng & cntngncy		
163	2166				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
164	2167				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
165	2168				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$15,771	$6,984	$908,444	$960,284
166	2169				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
167	2170				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
168	2171				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
169	2172				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
170	2173				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$124,692	$21,195	$15,771	$6,984	$988,444	$1,040,284
171	2174				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
172	2175				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
173	2176				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
174	2177				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
175	2178				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$15,771	$6,984	$908,444	$960,284
176	2179				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
177	2180				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
178	2181				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
179	2182				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
Total		$1,212,546	$2,534,460	$216,000	$3,604,587	$3,551,470	$674,461	$11,793,524	$40,200,000	$4,127,783	$1,404,893	$3,720,000	$90,000,000	$4,303,040	$2,600,829	$1,950,460	$8,231,882	$156,538,887	$168,332,411
PV		$32,328	$31,448	$13,409	$50,280	$19,200	$11,480	$158,145	$213,715	$57,555	$14,533	$11,604	$280,733	$12,560	$11,499	$5,997	$51,445	$659,640	$817,786

Table 5
Revised Groundwater Management Long-Term Trust Fund Estimate with Increased Costs
Phoenix Project, Nevada

Kuipers and Associates
15-Mar-04

Year		Monitoring Costs							Mitigation Costs										Total Costs
		Capital Costs		Operating Costs			Indirect Costs	Total Monitoring Costs	Capital Costs			Operating Costs					Indirect Costs	Total Mitigation Costs	
No	Calendar	WRF Mntrng	GW Mntrng	Admin	WRF Mntrng	GW Mntrng	Eng & cntngncy		Water Treatment	GW Pumping	Ancillary	Admin	Water Treatment	GW Pumping	Ancillary	Sludge Mgmnt	Eng & cntngncy		
1	2004	$202,091	$659,628		$24,521	$27,319	$155,109	$1,068,668	$6,700,000	$2,400,000	$596,526	$31,000	$750,000	$24,692	$21,195	$15,315	$1,745,375	$12,284,103	$13,352,771
2	2005				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
3	2006				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
4	2007				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
5	2008				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
6	2009				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$15,315	$6,984	$907,988	$959,828
7	2010				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
8	2011				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
9	2012				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
10	2013				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
11	2014				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$124,692	$21,195	$15,315	$6,984	$987,988	$1,039,828
12	2015				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
13	2016				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
14	2017				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
15	2018				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
16	2019				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$15,315	$6,984	$907,988	$959,828
17	2020				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
18	2021				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
19	2022				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
20	2023				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,315	$0	$842,202	$894,042
21	2024		$277,788		$24,521	$27,319	$50,002	$379,630	$6,700,000	$38,802		$31,000	$750,000	$124,692	$21,195	$17,965	$1,212,984	$8,896,638	$9,276,268
22	2025				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
23	2026	$202,091			$24,521	$27,319	$36,376	$290,307				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$1,135,159
24	2027				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
25	2028				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
26	2029				$24,521	$27,319	$0	$51,840		$64,736		$31,000	$750,000	$44,692	$21,195	$17,965	$11,652	$941,240	$993,080
27	2030				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
28	2031				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
29	2032				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
30	2033				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
31	2034				$24,521	$27,319	$0	$51,840		$38,802	$213,000	$31,000	$750,000	$124,692	$21,195	$17,965	$45,324	$1,241,978	$1,293,818
32	2035				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
33	2036				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
34	2037				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
35	2038				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
36	2039				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$17,965	$6,984	$910,638	$962,478
37	2040				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
38	2041				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
39	2042				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
40	2043				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$17,965	$0	$844,852	$896,692
41	2044		$659,628		$24,521	$27,319	$118,733	$830,201	$6,700,000	$38,802		$31,000	$750,000	$124,692	$21,195	$18,316	$1,212,984	$8,896,989	$9,727,190
42	2045				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
43	2046				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
44	2047				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
45	2048				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
46	2049				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$18,316	$6,984	$910,989	$962,829
47	2050				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
48	2051	$202,091			$24,521	$27,319	$36,376	$290,307				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$1,135,510
49	2052				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
50	2053				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
51	2054				$24,521	$27,319	$0	$51,840		$64,736	$28,467	$31,000	$750,000	$124,692	$21,195	$18,316	$16,777	$1,055,183	$1,107,023
52	2055				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
53	2056				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
54	2057				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043

Table 5
Revised Groundwater Management Long-Term Trust Fund Estimate with Increased Costs
Phoenix Project, Nevada

Kuipers and Associates
15-Mar-04

Year		Monitoring Costs							Mitigation Costs										Total Costs
		Capital Costs		Operating Costs			Indirect Costs	Total Monitoring Costs	Capital Costs			Operating Costs					Indirect Costs	Total Mitigation Costs	
No	Calendar	WRF Mntrng	GW Mntrng	Admin	WRF Mmtrng	GW Mntrng	Eng & cntngncy		Water Treatment	GW Pumping	Ancillary	Admin	Water Treatment	GW Pumping	Ancillary	Sludge Mgmnt	Eng & cntngncy		
55	2058				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
56	2059				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$18,316	$6,984	$910,989	$962,829
57	2060				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
58	2061				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
59	2062				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
60	2063				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$18,316	$0	$845,203	$897,043
61	2064				$24,521	$27,319	$0	$51,840	$6,700,000	$38,802	$213,000	$31,000	$750,000	$124,692	$21,195	$14,964	$1,251,324	$9,144,977	$9,196,817
62	2065				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
63	2066				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
64	2067				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
65	2068				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
66	2069				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$14,964	$6,984	$907,637	$959,477
67	2070				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
68	2071				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
69	2072				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
70	2073				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
71	2074		$277,788		$24,521	$27,319	$50,002	$379,630		$38,802		$31,000	$750,000	$124,692	$21,195	$14,964	$6,984	$987,637	$1,367,267
72	2075				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
73	2076	$202,091			$24,521	$27,319	$36,376	$290,307				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$1,132,158
74	2077				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
75	2078				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
76	2079				$24,521	$27,319	$0	$51,840		$796,337		$31,000	$750,000	$44,692	$21,195	$14,964	$143,341	$1,801,529	$1,853,369
77	2080				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
78	2081				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
79	2082				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
80	2083				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$14,964	$0	$841,851	$893,691
81	2084				$24,521	$27,319	$0	$51,840	$6,700,000	$38,802		$31,000	$750,000	$124,692	$21,195	$15,192	$1,212,984	$8,893,865	$8,945,705
82	2085				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
83	2086				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
84	2087				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
85	2088				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
86	2089				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$15,192	$6,984	$907,865	$959,705
87	2090				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
88	2091				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
89	2092				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
90	2093				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
91	2094		$659,628		$24,521	$27,319	$118,733	$830,201		$38,802	$213,000	$31,000	$750,000	$124,692	$21,195	$15,192	$45,324	$1,239,205	$2,069,406
92	2095				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
93	2096				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
94	2097				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
95	2098				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
96	2099				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$15,192	$6,984	$907,865	$959,705
97	2100				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
98	2101	$202,091			$24,521	$27,319	$36,376	$290,307				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$1,132,386
99	2102				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
100	2103				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,192	$0	$842,079	$893,919
101	2104				$24,521	$27,319	$0	$51,840	$6,700,000	$64,736	$140,900	$31,000	$750,000	$124,692	$21,195	$15,771	$1,243,014	$9,091,308	$9,143,148
102	2105				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
103	2106				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
104	2107				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
105	2108				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
106	2109				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$15,771	$6,984	$908,444	$960,284
107	2110				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
108	2111				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498

Table 5
Revised Groundwater Management Long-Term Trust Fund Estimate with Increased Costs
Phoenix Project, Nevada

Kuipers and Associates
15-Mar-04

Year		Monitoring Costs							Mitigation Costs										Total Costs
		Capital Costs		Operating Costs			Indirect Costs	Total Monitoring Costs	Capital Costs			Operating Costs					Indirect Costs	Total Mitigation Costs	
No	Calendar	WRF Mntrng	GW Mntrng	Admin	WRF Mmtrmg	GW Mntrng	Eng & cntngncy		Water Treatment	GW Pumping	Ancillary	Admin	Water Treatment	GW Pumping	Ancillary	Sludge Mgmnt	Eng & cntngncy		
109	2112				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
110	2113				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
111	2114				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$124,692	$21,195	$15,771	$6,984	$988,444	$1,040,284
112	2115				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
113	2116				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
114	2117				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
115	2118				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
116	2119				$24,521	$27,319	$0	$51,840		$38,802		$31,000	$750,000	$44,692	$21,195	$15,771	$6,984	$908,444	$960,284
117	2120				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
118	2121				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
119	2122				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
120	2123				$24,521	$27,319	$0	$51,840				$31,000	$750,000	$24,692	$21,195	$15,771	$0	$842,658	$894,498
Total		$1,010,455	$2,534,460	$0	$2,942,520	$3,278,280	$638,085	$10,403,800	$40,200,000	$4,127,783	$1,404,893	$3,720,000	$90,000,000	$4,303,040	$2,543,400	$1,950,460	$8,231,882	$156,481,458	$166,885,257
PV		$249,530	$748,594	$0	$377,049	$420,073	$179,662	$1,974,908	$8,779,345	$2,364,353	$597,009	$476,674	$11,532,433	$515,940	$325,907	$246,354	$2,113,327	$26,951,342	$28,926,250